WILKES UNIVERSITY



BULLETIN

1990-1991

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Wilkes University affirms that all persons shall have equal access to admission, programs, and employment without regard to race, religion, sex, national origin, handicap, or age.

Statement of Disclaimer

The statements in this Bulletin are for purposes of information. The University reserves the right to change any provisions or requirements, including tuition and fees at any time within the student's term of residence. No contract is created or implied. Students must fulfill all prevailing degree or program requirements.

Wilkes University

1990-91

Bulletin

Baccalaureate Studies

WILKES UNIVERSITY
Wilkes-Barre, Pennsylvania 18766
Telephone (717) 824-4651

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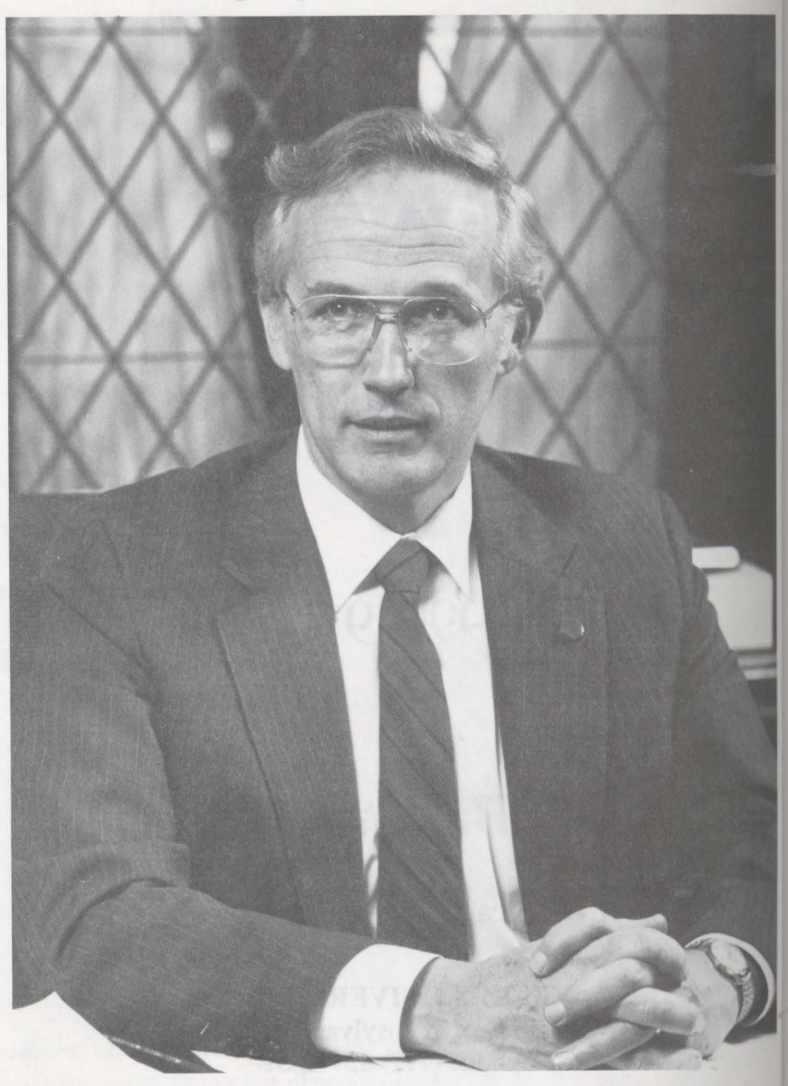
A Message from the President



Christopher N. Breiseth, President

At Wilkes you will encounter an exciting intellectual and social community. As you define your role in this community of learners and scholars, you will come to know the challenges and joys — as well as the controversies — of the collegiate life that we share and love.

I believe that as you invest your time and talents at Wilkes to prepare to achieve your own definition of success and fulfillment, you will discover that you are becoming part of Wilkes and that Wilkes is becoming part of you.

An Educated Man or Woman

seeks truth, for without truth there can be no understanding;

possesses vision, for we know that vision precedes all great attainments;

is aware of the diversity of ideas and beliefs that exists among all people;

has faith in the power of ideals to shape the lives of each of us;

knows that mankind's progress requires intellectual vigor, moral courage, and physical endurance;

cultivates inner resources and spiritual strength, for they enrich our daily living and sustain us in times of crisis;

has ethical standards by which to live;

respects the religious convictions of all people;

participates constructively in the social, economic, cultural, and political life of the community;

communicates ideas in a manner that assures understanding, for understanding unites us all in our search for truth.

—Formulated and adopted by the Wilkes University faculty as a guide to learning.

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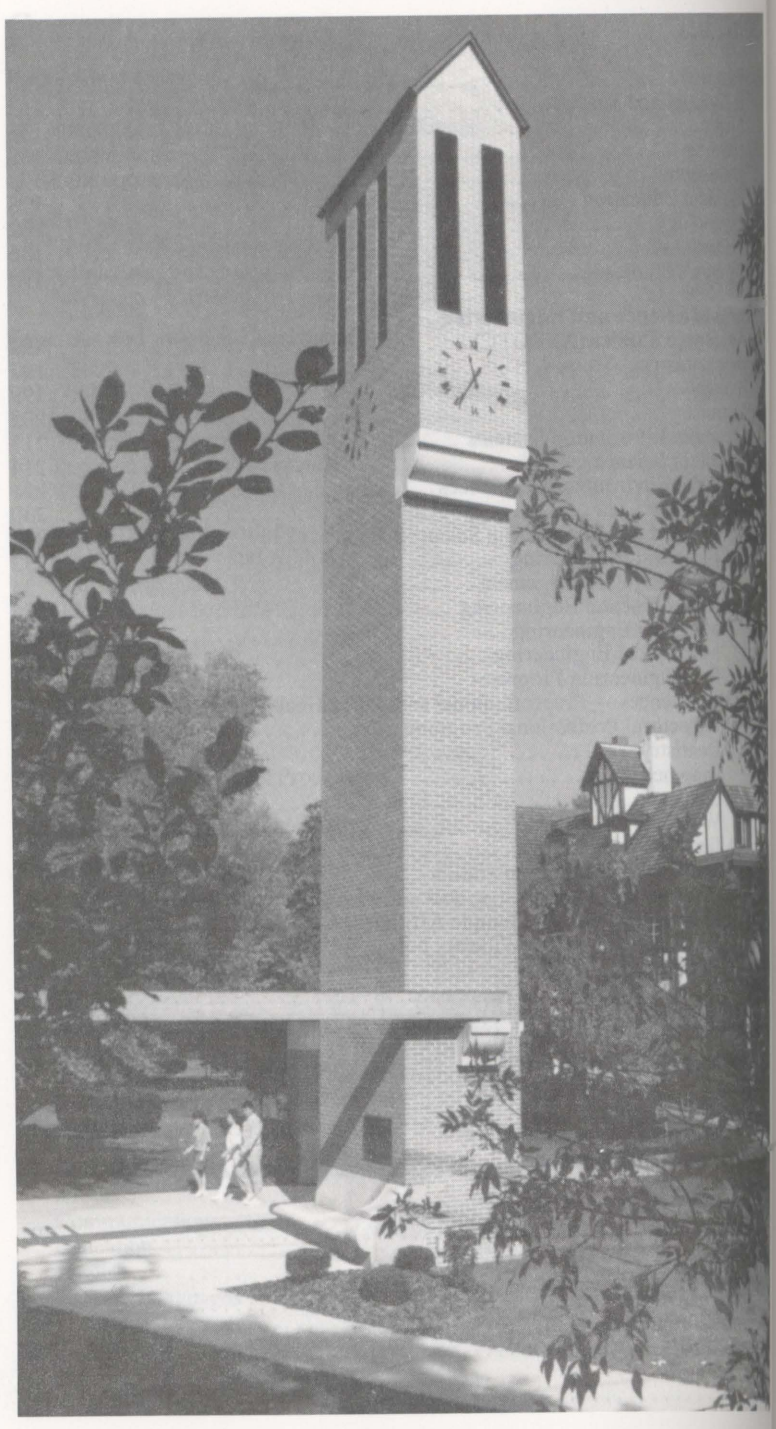

Wilkes University

Overview

Wilkes is a comprehensive, independent institution of 2,200 undergraduate and 500 graduate students, located in the historic district of Wilkes-Barre in the Pocono region of northeastern Pennsylvania. Formerly Wilkes College, Wilkes was granted university status by the Commonwealth of Pennsylvania in January of 1990. The University is structured as three academic units: the School of Business, Society, and Public Policy; the School of Liberal Arts and Human Sciences; and the School of Science and Engineering. A broad range of bachelor's and master's programs are offered in the humanities, social and natural sciences, business administration, nursing, and engineering. The park-like 26-acre campus parallels the Susquehanna River and features the newly constructed Marts Sports and Conference Center, fully equipped science and engineering facilities, and a number of architecturally significant nineteenth century mansions, renovated for use as residence halls and academic buildings. The center of regional theater, ballet, and musical performances, Wilkes-Barre is 2½ hours from the cultural resources of either New York City or Philadelphia. Wilkes draws its increasingly diverse student body from Maine to Florida, and especially from the New York-Philadelphia-Baltimore-Washington, D.C. population corridor. The University is accredited by the Commission on Higher Education of the Middle States Association of Colleges and Schools, and has specialized accreditation in nursing and engineering.

The Wilkes undergraduate curriculum focuses on a strong and innovative core program in the arts and sciences, required of all students, which includes interdisciplinary seminars, instruction in public speaking, and technological literacy components. Majors are available in over twenty-five fields, with business administration, biology, engineering, nursing, psychology, communications, and music attracting the largest number of students. Teaching excellence is the highest priority for the 150-member faculty, while academic advising integrated with career planning is also stressed. Hands-on experiences are provided in laboratory, internship, and cooperative education settings.

Residential facilities on campus accommodate 950 students, and campus housing is available for all four years. Residential alternatives range from traditional single-sex dormitories to coeducational facilities, with men and women in different sections of the same building. Architecturally, residence halls vary from modern, multifloor buildings to mansions listed on the National Register of Historic Places. Medical and dental care, department stores, specialty shops, and banks are available within one block of the campus. The historic district includes a large number of churches and synagogues, which welcome students' participation in worship and youth activities.

An active and varied intramural program involves the majority of students. Intercollegiate athletics encompass fourteen sports, including the region's only collegiate football program. Athletic scholarships are awarded only in wrestling, which is a nationally competitive NCAA Division I program. Other sports are administered in strict conformity with NCAA Division III regulations.

History

The institution that is now Wilkes University was founded in 1933, when the Trustees of Bucknell University established a branch, two-year campus in Wilkes-Barre. The new college, known as Bucknell University Junior College, was successful in attracting as students, able and highly motivated young persons, virtually all of whom were the first members of their families to benefit from higher education. The college also received support and encouragement from leading members of the Wilkes-Barre Community, many of whom served on the Board of Trustees. The stately mansions on campus that are now used by the university for some of its residence halls and offices testify to the tradition of community service and generosity characteristic of the Wilkes-Barre area's leadership. The college was especially fortunate to have its own inspired and talented leaders in Arnaud C. Marts, president of Bucknell and Eugene S. Farley, director of the Wilkes-Barre campus.

In 1947, the institution became Wilkes College, an independent, non-denominational four-year college, with programs in the arts and sciences and a number of professional fields as well as a full program of extra-curricular activities. The student body and faculty grew rapidly in the 1950's, and expansion into graduate studies followed in the 1960's and 1970's.

In the 1980's, Wilkes gained recognition as an increasingly sophisticated regional center for teaching, applied research, cultural affairs, and public service programs. Designation as Wilkes University in 1990 capped an eventful and productive half century of development, and signaled the beginning of a new era of progress as an increasingly distinguished and prominent academic institution.

Statement of Institutional Mission and Goals

The Wilkes Tradition

Community Service

Founded in 1933 as a junior college, Wilkes came into existence in the midst of the economic crisis caused by the simultaneous collapse of anthracite coal mining in Northeastern Pennsylvania and the onset of the Great Depression in the nation and the world. The College fulfilled the important mission of making higher education accessible to ambitious but underprivileged youth and producing new leadership for an area in dire need of re-

newal and hope for the future. After World War II, Wilkes responded again to a community need, growing and transforming itself into a four-year college to aid in the massive task of preparing returning veterans for challenging and rewarding careers. More recently, as a part of the region's economic and cultural re-birth, Wilkes has developed into a comprehensive university, offering a broad range of bachelor's and master's degree programs, thus continuing the institution's tradition of service to the community through educational programs of high quality and direct relevance to the area's development.

Academic Excellence With Human Understanding

Wilkes' mission has been shaped in fundamental ways by the unique perspective on education of Eugene Shedden Farley, Wilkes president for more than thirty-five years, who possessed a distinctive vision of higher education — a vision articulated in his collected works, *Essays of an Educator.* Dr. Farley advocated a rigorous academic program which would require students to meet high standards and enable them to compete successfully in leading graduate and professional schools. Moreover, Dr. Farley's Quaker background led him to place equally strong emphasis on education's role in cultivating individual integrity, personal responsibility, and sensitivity to the beliefs and customs of persons from diverse cultural backgrounds. Wilkes' tradition of recruiting an ethnically and religiously diverse faculty and student body and ensuring that campus clubs and associations welcome all students as members can be traced to Dr. Farley's guidance of the College in its formative years. The only independent, non-denominational, four-year college in the region, Wilkes played a special role in building a close-knit campus community composed of persons from a wide variety of traditions and points of view. As a result, academic excellence and a campus environment of tolerance and diversity have come to be strong components of the Wilkes tradition.

Institutional Role and Identity

Wilkes University defines itself as an independent, nondenominational institution where students can combine a liberal arts and sciences education with professional preparation. Wilkes offers majors in the traditional disciplines of the humanities, social sciences, and natural and physical sciences. In addition, the University has developed strong professional programs in accounting, business, communications, engineering, music, and nursing. Wilkes brings together motivated students and a highly qualified, dedicated faculty and staff in a supportive atmosphere that encourages each student's intellectual and personal development. The challenge of high academic standards is matched by a learning environment that provides students with the personal attention and resources needed for full educational growth. Wilkes views itself as an institution at which students with varying prepara-

tion for college work receive an education of high quality which prepares them for the challenges of a rapidly changing world and for competitive graduate and professional schools.

Wilkes has a firm commitment to a core curriculum designed to help students discover and integrate the intellectual disciplines and to foster critical and creative thought, effective communication, mathematical skills, and computer literacy. Both the core and the total curriculum are periodically reviewed to ensure responsiveness to the important changes taking place in higher education and to support a broad but integrative educational experience. The strength of a Wilkes education is its balance of the theoretical and practical, of liberal learning and professional preparation. Students have the opportunity of applying knowledge to real problems by working in well-equipped laboratories, serving internships, and participating in cooperative education. Beyond balancing theory and practice, a Wilkes education seeks to increase students' capacity to serve others with intelligence, imagination, and integrity.

Extracurricular activities at Wilkes are central to the education of the whole person. Musical performance, athletics, radio and television broadcasting, AFROTC, student government, debate, social service organizations, drama, and a variety of clubs afford a broad range of opportunities for participation in college life. The Wilkes campus, located in the historic district of downtown Wilkes-Barre, brings together residential and commuting students in an atmosphere that promotes their full social and personal development.

A vital part of the mission of Wilkes University is service to Northeastern Pennsylvania. Wilkes has encouraged the fine arts and the performing arts through the Sordoni Art Gallery, the Dorothy Dickson Darte Center for the Performing Arts, and the cultural events that the University regularly sponsors. The Eugene Shedden Farley Library serves as a comprehensive information and resource center for the region. In response to the needs of business and industry, the University has become a regional center for engineering, science, and technology. The University also responds to the needs of part-time students by making most of its degree programs available to the nontraditional student through evening and weekend courses. In addition, a growing part of the University's community service is the program for continuing education, which provides courses for learners of all ages.

Building upon solid undergraduate programs, Wilkes also provides an important service by offering graduate degrees for students who wish to acquire advanced education in specific professional fields. Most of the graduate programs at Wilkes are multidisciplinary. The teachers of the region are served by master's degrees in education and in the humanities, social sciences, and sciences. Master's degrees in business administration, electrical engineering, nursing, and health care administration are designed to prepare students for professional advancement.

Mission: Education and Service for a Dynamic Future

While a cherished tradition and a sense of institutional identity may provide inspiration and suggest broad guidelines, the question of institutional mission must be continually examined in light of developments in society and technology. Specifically, Wilkes must strive to identify goals and conduct programs which will be of value to its students and the community in the social and technological environment of the future.

Society will continue to be in a state of constant, transforming change in response to new information, technological advances, and unanticipated developments. A society characterized by extensive change demands education which prepares individuals and communities to be flexible and adaptive, ready to benefit from innovation. In particular, those in leadership positions must be educated to manage successive waves of change and to channel those changes productively. Wilkes' overarching imperative must be to educate its students and help the surrounding community to flourish in a setting of technological and societal dynamism.

Wilkes defines its mission as the education of men and women to develop essential intellectual skills, to master the core concepts and principles of their chosen fields and disciplines, to be sensitive to aesthetic concerns and ethical issues, and to be well prepared to adapt to change in their careers and in community life. The University is also committed to conduct applied research and outreach programs which will facilitate economic and cultural progress in the region while enriching the educational experiences of students and faculty members. By excelling in these approaches to teaching, research, and service, Wilkes aims to contribute to the supply of human resources and applied knowledge needed for a more prosperous, cultured, and humane society.

Goals

Baccalaureate Programs

A variety of carefully structured undergraduate educational programs derive from Wilkes's primary purpose. Each degree program is designed to achieve particular educational objectives; however, all baccalaureate programs share a set of distinctive goals which define the Wilkes approach to baccalaureate education. They include:

1. **A commitment to high standards of academic achievement and, thereby, to the integrity of the baccalaureate degree.**

   Wilkes offers programs of undergraduate studies that attract students who approach college primarily as an opportunity for intellectual growth and development. Course requirements are demanding and instructors' expectations of students are high. The result is an educational setting which, while supportive of students and sensitive to their individual needs, ultimately requires strong academic performance for program completion.

2. **Completion of an extensive core curriculum in the fundamental fields of the arts and sciences.**

The core curriculum is designed to develop:

— proficiency in written and oral communication;

— facility in employing quantitative and other problem-solving methods;

— sensitivity to ethical issues;

— capacity to analyze issues critically and reach independent judgments regarding them;

— understanding of the uses and challenges of science and technology;

— appreciation of the arts and their societal roles;

— knowledge of the history and contemporary functioning in the American setting of social and political institutions;

— acquaintance with diverse perspectives on human nature and behavior; and

— a sense of the cohesion of all knowledge and human understanding.

3. **An instructional approach which defines the student as an active participant rather than a passive observer in the classroom, laboratory, and other learning settings.**

Education is viewed as much more than the transfer of information from instructors to students. Emphasis is placed on interactive instructional approaches, which provide opportunities for students to engage in a dialog with their instructors and fellow students and to become actively involved in the quest for and application of knowledge. The student is not a spectator but a primary actor in the educational process; the instructor's role is to assist in discovering, drawing out, and developing the student's capabilities. Students also develop initiative and leadership through a full program of extra curricular activities.

4. **Curricular and programmatic features which help students integrate theoretical understanding with the application of knowledge in professional and community settings.**

Students are expected to learn from experience through case studies, simulation exercises, experiential learning programs, and participation in the initiatives their professors undertake to apply knowledge through outreach activities.

5. **An approach to curriculum which emphasizes principles, ideas, and analytical procedures that cut across and transcend the boundaries of particular disciplines and facilitate life-long learning.**

Through interdisciplinary courses as well as projects or papers which require the synthesis of knowledge, students are encouraged to generalize and to develop skills that will enable them to continue learning throughout their lives, in their own as well as other fields of knowledge. A rapidly changing society places a premium on adaptability and breadth of knowledge, fostered by a grasp of fundamental principles rather than by narrow specialization in current practices. To prepare competent individuals for the future, Wilkes focuses on cultivating individuals who are well equipped to adapt to change.

6. **Careful, personalized academic and career advisement to ensure that students pursue coherent programs of study and devote appropriate attention to planning for the transition from college to a career or graduate study.**

At Wilkes, the responsibility of a college educator is defined as extending beyond the classroom to include support for each student's formulation of long-range goals. The advisor-advisee relationship focuses on personal strategic planning for the student's future, integrating curricular decisions with the student's post-graduation objectives.

7. **Maintenance of an academic environment which is free from *a priori* commitments to particular ideologies or creeds.**

Wilkes represents an important component of the rich diversity of American higher education — the independent, non-sectarian institution. While supportive of the moral, ethical, and religious development of its students, Wilkes does not subscribe to a particular denominational creed.

Protection of the independence of the faculty and the curriculum from governmental prescription and the preservation of private sector initiative in higher education are fundamental commitments of the institution.

8. **Articulation and pursuit of the highest standards of personal integrity and professional responsibility.**

Students, faculty, and staff constitute a community of learning whose members share responsibility for maintaining rules which promote honesty, self-discipline, and the common good, proscribing cheating, plagiarism, or other forms of misrepresentation.

Graduate Programs

In the last decade, Wilkes has increased substantially its engagement in graduate programs at the master's degree level in the arts and sciences as well as professional fields. Emphasis has been placed on programs that are responsive to student needs for career advancement and the institution's role in applied research and outreach to the region. The graduate program, viewed as a whole, has the following defining and distinctive goals:

1. A focus on programs designed for persons who are seeking personal growth, career advancement, and professional development.
2. Concentration on graduate degree programs intended to advance the economic and cultural development of the region.
3. Engagement in outreach programs which link external organizations with campus academic life and provide opportunities for applied research to graduate students and faculty members.
4. A multi-disciplinary approach to graduate studies, emphasizing breadth and adaptability to changing professional and societal conditions.
5. The development of carefully structured cooperative agreements, which provide for the offering of other institutions' programs on the Wilkes campus and the offering of Wilkes's programs on other campuses in the region.
6. Concentration on graduate programs in fields which are already strong in terms of faculty, facilities, and library resources at the undergraduate level and which will be augmented by graduate level offerings.

Wilkes envisions an expanding role in graduate education; however, the primary focus of the institution will remain on excellence in undergraduate studies.

Continuing Education and Cultural Affairs

A variety of non-credit courses, exhibits, workshops, and performances are provided to enhance community life and to help individuals attain career goals. The Sordoni Art Gallery brings programming in the fine arts to both the campus and the Wilkes-Barre area. Throughout the year, music and theater programs offer concerts and dramatic productions at the Dorothy Dickson Darte Center for the Performing Arts. Continuing education courses are offered for personal educational enrichment as well as for the preparation of new entrants to the job market and the in-service training of established professionals.

In Conclusion

The faculty, administration, and Board of Trustees continually assess the purposes and goals of Wilkes University and the programs designed to attain them. The unchanging principle guiding the University is to provide educational opportunities and outreach services which are responsive to student and community needs and consistent with Wilkes's tradition of service, excellence, and diversity.

Accreditation

Wilkes University offers degrees and programs approved by the Department of Education of the Commonwealth of Pennsylvania and accredited by the Commission on Higher Education of the Middle States Association of Colleges and Secondary Schools. Certain academic programs are also individually accredited by appropriate professional organizations. The Chemistry curriculum is approved by the American Chemical Society. The Electrical and Materials Engineering programs are accredited by the Accreditation Board for Engineering and Technology (ABET). The baccalaureate program in Nursing is approved by the Pennsylvania State Board of Nurse Examiners and is accredited by The National League for Nursing.

Buildings and Facilities

The **E. S. Farley Library,** named for Wilkes's first president, exists to provide its users with effective access to recorded information. The Library has acquired a substantial collection of carefully selected materials in a variety of formats and media, including nearly 200,000 volumes, 1,200 current journal and newspaper subscriptions, and over 500,000 microforms. Particular subject strengths include English literature, American cultural history, and the history of science. The Farley Library's automated catalog system enables users to search the various collections at Wilkes (books, journals

and audiovisual materials) by author, title, and subject on public access terminals. Online database searching is available to students and faculty through the Reference Department of the Library. Special facilities include a microcomputer lab, special collections rooms, audio/visual resources and microform equipment. Library collections are supplemented by cooperative arrangements with other libraries. Through a variety of printed and online sources, the Library is able to identify and locate virtually any published materials needed by Library users.

The **Dorothy Dickson Darte Center for the Performing Arts** features a fully-equipped, 500-seat theater on a site donated by the Wyoming Valley Society of Arts and Sciences. The Center's facilities include a scene shop, dressing rooms, rehearsal areas, costume rooms, hydraulic lift forestage, patch panel with 246 circuits, and a 10-scene preset with 60 dimmers. The facility is well-equipped for instructional use and regularly used for university and community presentations.

The **Dorothy Dickson Darte Music Building** opened in the summer of 1969 as the second phase of the Center for the Performing Arts. It houses faculty offices, studios, classrooms, practice and rehearsal rooms, and it is the centerpiece for the University's highly regarded music programs. Concerts and recitals are regularly presented in Gies Recital Hall and are open to the public.

The **Sordoni Art Gallery,** given to Wilkes in 1973 by The Andrew J. Sordoni Foundation, Inc. is located in Stark Learning Center. The main purpose of this modern facility is to present art exhibitions to enrich campus and community life. Exhibitions are supplemented by lectures, tours, demonstrations, and related arts programs. A growing permanent collection embraces all media but is particularly strong in nineteenth and twentieth century American and European paintings. The print collection includes works of the old masters as well as contemporary artists. The Gallery is a particularly valuable study facility for students.

Stark Learning Center, named in honor of the late Admiral Harold R. Stark, Honorary Chairman of the Board of Trustees, opened in 1958 and was expanded in 1973. Stark Learning Center is the major instructional facility on campus, and it provides approximately 85,000 square feet of modern classroom, laboratory, studio and office space.

Academic Computing Facilities include two Digital Equipment Corporation VAX computer systems connected to a DECNET network located in the Stark Learning Center. The VAX 6310, with 32-MBytes of main memory and 2.4-GBytes of disk space, and the MV3500, with 32-MBytes of main memory and 2.3-GBytes of disk space, currently support over 120 terminal and dial-up access points as well as various printers and peripherals. These systems are used not only for programming but also for statistics, sci-

ence, simulation and electronic mail. Various micro computer systems located in Stark Learning Center and connected to the VAX network allow file transfer from and to the VAX systems. Micro computer laboratories containing IBM PC, PC compatible, Apple Macintosh and Apple IIe systems are located in Fortinsky Hall, Farley Library and Stark Learning Center. The various micro computer laboratories are used for instruction as well as general student use. A growing library of software is available on the mini and micro computer systems for use by students and faculty. Other specialized mini/micro computer laboratories include the CAD/CAM and CAE/Manufacturing Labs. The University library system is run on the Hewlett Packard 3000/68 with 5-MBytes of memory and 2.5-GBytes of disk space.

The **Conyngham Student Center,** refurbished by the Conyngham family and friends, is a multi-functional unit available to individual students and student organizations for activities and relaxation. It includes a snack bar and game room and provides a pleasant meeting place for students and faculty alike. It also houses the offices of the Deans of Student Affairs.

The **Arnaud C. Marts Sports and Conference Center,** named in honor of the person most responsible for the founding and nurturing of Wilkes University, opened in 1989. The three-story, 75,000-square-foot building on South Franklin Street houses the new gymnasium, with dedicated space for health facilities, physical education classes, faculty offices, intramural and intercollegiate sports, and the offices of the Athletic Director and the Associate Director of Athletics. The gymnasium seats 3,600 people. In addition, the Marts Center provides pleasant conference facilities, classrooms, and the Registrar's Office. Dr. Marts, while serving as president of Bucknell University, made the decision to establish a branch campus of Bucknell in Wilkes-Barre.

The University's **Residence Halls** house 950 students in a variety of living arrangements in facilities ranging from stately Victorian and Tudor mansions to the ultra-modern accommodations of Evans Hall. Each residence hall is staffed by graduate or undergraduate Resident Assistants, who provide guidance and supervision and assist in the development of a constructive learning environment. Available to all single full-time students, full-time undergraduate students who are under 18 years of age are **required** to live in college residence halls during their first and second semesters unless they have been granted permission from the Residence Life Office to reside off campus or they commute from the home of their parents or legal guardian. Detailed information regarding residence halls and residence life can be obtained from the Office of Admissions or the Residence Life Office.

Admissions

Admission Requirements
Admission Procedures
Advanced Placement

Admission

Required High School Preparation

A student's secondary school preparation should include a college preparatory curriculum with four years of English, three years of mathematics, two years of a foreign language, two years of science (including a laboratory component), one year of history and, if available, introduction to computing. Additional courses should be elected in academic subjects according to individual interests. Students whose preparation has not followed this pattern may still qualify for admission if there is other strong evidence that they are prepared for college work.

Students intending to major in Biology, Chemistry, Computer Science, Engineering, Mathematics, Medical Technology, or Physics should have at least three years of college preparatory mathematics courses (including algebra II, geometry, and topics in trigonometry) to be prepared to take Mth 105 or 111 (calculus) in the first term of the freshman year. The student without such background is advised to take, preferably in the summer preceding entrance, Mth 100 (algebra and trigonometry) offered at Wilkes or an equivalent course at another college or university. Credits in such remedial courses will not exempt the student from any required course in these programs.

Students majoring in Nursing are required to have completed courses in English (four units), Social Studies (three units), Mathematics (two units including algebra), and Science (two units including biology and chemistry) during their secondary school programs.

Application for Admission

Applications for admission and instructions regarding secondary school records, recommendations, and entrance examinations may be obtained from the Office of Admissions. The completed applications should be returned directly to the Admissions Office with a non-refundable $25 application fee.

Admissions Tests

The Scholastic Aptitude Test (SAT) of the College Entrance Examination Board is required of all applicants. Students should plan to take this examination in the fall term of their senior year, although many applicants take the exam in their junior year. Wilkes is a member of the College Entrance Examination Board.

Students communicating with the Educational Testing Center in Princeton, New Jersey, or in Los Angeles, California, should refer to the Wilkes University code number 2977.

Acceptance of Admission and Deposit

After receipt of the secondary school record, the secondary school recommendations, and the senior College Board scores, the Admissions Office acts upon all applications. Notification of action is sent immediately. Resident students should guarantee their place in the entering class by forwarding a $150 tuition and residence hall deposit to the Office of Admissions by May 1. Commuting students are required to forward a $50 tuition deposit to the Admissions Office by May 1 to secure their place. (Fees applicable for September, 1990.)

Upon their acceptance for admission to the University, music applicants will be required to audition for the music faculty.

The University accepts a limited number of applications for the spring semester. Procedures are similar to those followed in the fall semester.

Campus Visits

Although a personal interview with each student is not required, an interview is strongly recommended. Students and their families are encouraged to visit the University at their convenience. It is advisable to call or write for an appointment so that the appropriate deans may arrange to meet with them.

A number of campus visitation days are held during the academic year. Visitation days include a general meeting with the admissions staff, current students, and administrative personnel; a tour of the campus; a light lunch; and meetings with faculty from the academic departments. Specific information about and the dates of the visitation days are available upon request from the Office of Admissions.

Admission of International Students

In order to be considered for admission to Wilkes University, international students must submit the following: completed application, official results of the TOEFL (Test of English as a Foreign Language) or evidence of the successful completion of an accredited intensive English language program, Declaration of Finances Form (which may be obtained from the Wilkes University Office of Admissions), official transcripts of all secondary and/or post-secondary work completed to date, and a copy of the secondary and/or post-secondary diploma or leaving certificate.

Students should apply by June 15 for the fall semester or November 15 for the spring semester.

The form I-20 is issued only when the application is complete and the candidate is judged to be admissible.

Admission of Transfer Students

The University welcomes transfer students from other accredited colleges and universities for both the fall and spring semesters. Transfer students must submit a formal application, a high school transcript, a transcript from each post-secondary institution attended, and their Scholastic Aptitude Test scores if they have earned fewer than 30 credits. Applicants must be in good academic standing with a minimum grade point average of 2.00 (C) at the beginning of the semester they first enroll at Wilkes. All courses with a grade of 2.00 (C) or better that are comparable to the curriculum at Wilkes will be accepted for transfer. Students transferring into the nursing program must arrange their schedule and register **after** consultation with the chairperson of the Department of Nursing.

All transfer students must complete a minimum of 30 credits (exclusive of advanced placement credit awarded by Wilkes) and a minimum of one-half of their major field credits at Wilkes University.

Transfer students from two-year institutions must complete a minimum of 60 credits at baccalaureate degree-granting institutions.

Grades earned in courses accepted for transfer are **not** included in the computation of the cumulative grade point average earned at Wilkes University.

Transfer students should consult the Graduation Requirements on page 7 of this Bulletin for institution-wide graduation requirements.

University policy prohibits the Office of Admissions from admitting any student who has been dismissed from any other college or university until a period of one year has elapsed from the time of dismissal. Students who have been placed on probation by a college or university will be considered for admission on a case by case basis.

Readmission to the University

Students who have been enrolled full-time at the University and have terminated their studies but wish to return as full-time students must contact the Registrar's Office and meet with one of the deans in the Student Affairs Office as the first step in the readmission process.

Admission of Part-time Students

Those who wish to enroll as part-time students should contact the Office of Evening, Summer, and Weekend Programs to discuss their plans and to obtain an Application for Admission. Students who have completed college-level work at another institution must submit an official transcript of that work as part of the admission process. Those who have completed no college work should arrange to have an official high school transcript forwarded in support of their application. All documentation should be sent to the Evening, Summer, and Weekend Office.

Part-time to Full-time

Part-time students who wish to enroll as full-time students must consult with the Director of Evening, Summer, and Weekend Programs as the first step in this process. Students who have completed 30 or more credits and have maintained a grade point average of 2.00 will be accepted as full-time students. Students who have completed fewer than 30 credits will be required to provide high school transcripts and appropriate test scores in support of their petition to enroll full-time, **before** a decision will be made.

Advanced Placement Credit

Wilkes University encourages students to work to their full capacity and to advance as rapidly as appropriate in their academic work. A number of opportunities are open to qualified high school juniors and seniors, as well as to adults returning to school after an interval of work or military experience, to demonstrate competence beyond that normally associated with graduation from high school. Academic credit may be granted for such demonstrated competence through a variety of channels.

Advanced Placement Program

Students who have successfully passed one or more of the Advanced Placement Tests administered by the College Entrance Examination Board may request advanced placement and/or academic credits. Advanced Placement means that the student may be scheduled for a course at a more advanced level; a decision on advanced placement is made after review of the examination by the academic department concerned. Credit means that the student receives credit toward the hours required for graduation. Generally, credit will be granted for scores of 3, 4, or 5. Occasionally, a personal interview may be required before placement and/or credit is awarded. No grades are assigned to the courses for which the student receives advanced placement credit. Information on specific course examinations and credit may be obtained from the Office of Admissions.

College-Level Examination Program

The University grants credits on the basis of satisfactory performance on the Subject Examinations, **not** the General Examinations, of the College-Level Examination Program (CLEP) administered by the College Entrance Examination Board. CLEP credits from an accredited institution are transferable to the University. Although the program is designed primarily for adults, exceptionally well qualified high school seniors may find it advantageous to seek academic credit through the CLEP. The following CLEP Subject Examinations and course equivalencies have been approved by the various academic departments:*

CLEP Subject Examination	Wilkes Course Equivalent	Credit
Intro. to Accounting	Accounting 101	3
General Biology	Biology 103 & 104	3&3
Microbiology	Biology 113	4
Anatomy	Biology 115	4
Physiology	Biology 116	4
Intro. to Marketing	Business Admin. 222	3
Intro. to Business Law	Business Admin. 231	3
Intro. to Management	Business Admin. 251	3
General Chemistry	Chemistry 101	3
Fortran IV	Computer Science 123	3
Intro. Macroeconomics	Economics 101	3
Money & Banking	Economics 201	3
History of American Educ.	Education 201	3
Educational Psychology	Education 202	3
Tests & Measurements	Education 351	3
Freshman English	English 101	3
College Composition	English 101	3
Analy. & Interpret. of Lit.	English 102	3
English Literature	English 253 & 254	3&3
American Literature	English 381 & 382	3&3
College French – Levels 1&2	French 101 & 102	3&3
College German – Levels 1&2	German 101 & 102	3&3
Western Civilization	History 101 & 102	3&3
American History	History 207 & 208	3&3
College Algebra – Trig.	Mathematics 100	4
Calculus w/Elem. Func.	Mathematics 111	4
Statistics	Mathematics 150	3
American Government	Political Science 102	3
General Psychology	Psychology 101	3
Intro. to Sociology	Sociology 101	3
College Spanish – Levels 1&2	Spanish 101 & 102	3&3

*Scores must be at the 50th percentile or above.

Official scores on CLEP Subject Examinations should be forwarded di rectly to the Evening, Summer, and Weekend Office for evaluation.

Credit for Military Experience

Students who have completed the special educational programs offered b branches of the American armed services may be granted academic credi for this course-work. Such students should submit an official transcript o their work as part of the admissions process. Transcripts will be evaluate according to the guidelines provided by the American Council on Educa tion, and credits granted will be applied to the degree program as appropri ate. For more information on this program, contact the Office of Admi sions.

Challenge Examinations

After admission to Wilkes University, a student may wish to take an examination demonstrating competence in a particular course. The interested student should apply to the appropriate department chairperson for permission to take a challenge examination. The chairperson will approve the student's application in writing only on the basis of a judgment that the student has adequate background in the field. If denied a challenge examination, the student may appeal to the appropriate unit dean. The student may not challenge a course that he/she has failed.

A fee of $23 per credit will be assessed by the Financial Management Office for each approved challenge examination. The student must present a receipt to the department chairperson at least thirty days before the examination will be administered. Credit for the course is given and a grade of **P** recorded if the student passes the examination. No grade or credit is recorded if the student fails the examination.

RN – Validation of Prior Learning

Registered nurse students and students who are eligible to sit for NCLEX-RN may validate prior learning by successfully completing the Mosby Assess Test (Secured Version). Upon successful completion of this examination and Nursing 299, the student will receive credit for Nursing 202, 203 and 204. Registered nurses should contact the Department of Nursing for more information on this program.

Experiential Learning

Credit for life experience may be granted for documented college-level learning that a student acquires through non-collegiate experiences. This credit is awarded for the learning derived from life experiences, **not** for the experiences themselves.

Soon after admission to the University, students who plan to petition for experiential learning credit must inform their academic advisor of their intent. All other means of securing credit for demonstrated competencies must have been exhausted before applying for experiential learning credit.

Credit awarded for experiential learning is based exclusively on Wilkes' evaluation of the demonstrated knowledge which is presented in the student's petition for experiential learning credit. Specific guidelines and procedures for the petitioning and awarding of experiential learning credits are available to interested students at the Registrar's Office. The Academic Standards Committee of the faculty maintains the guidelines and procedures of the Policy on Experiential Learning and makes the final decision on the awarding of credit.



Expenses and Financial Assistance

Tuition and Fees
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Student Expenses

The following chart summarizes student expenses for the 1990-91 academic year which offically begins with the 1990 summer sessions. Students are referred to the course descriptions in this Bulletin for laboratory and other fees associated with particular courses. Inquiries about particular charges should be addressed to the Financial Management Office.

Student Expenses for 1990-91

Full-time Undergraduate:	Assessment	Each Semester	Total for Year
*Tuition (12-18 Credits)	Per Semester	$4,100	$8,200
Room	Per Semester	$1,100	$2,200
Board			
19 Meal Plan	Per Semester	$ 800	$1,600
14 Meal Plan	Per Semester	$ 742	$1,484
Commuters Only			
9 Meal Plan	Per Semester	$ 422	$ 844
5 Meal Plan	Per Semester	$ 250	$ 500
Room Damage Deposit	One Time	$ 50	—
General College Fee	Per Semester	$ 100	$ 200
Activity Fee	Per Semester	$37.50	$ 75
Health and Accident	Full Year	—	$ 110
Insurance (Mandatory)	Spring Only	$ 74	

*Credits above 18 will be assessed at the rate of $228 per credit hour.

Part-time Undergraduate:			
Tuition (1-11½ credits)	Per Credit	$ 228	—
General College Fee	Per Credit	$ 4	—

Summer Sessions — Undergraduate:			
Tuition	Per Credit	$ 228	—
General College Fee	Per Credit	$ 4	—
Summer Board	Per Week	$ 55	—
Summer Room	Per Week	$ 55	—
Room Damage Deposit	One Time	$ 50	—

Other Fees and Charges:			
Acceptance Deposit:			
Resident Student	One Time	$ 150	—
Commuter Student	One Time	$ 50	—
Application Fee	One Time	$ 25	—
Applied Music Fee	Per Lesson Series	$ 185	—
Audit Fee:			
Full-time Students	No Tuition Charge	—	—
Part-time Students, Summer	Per Credit	$ 116	—
Part-time Students, Fall, Spring	Per Credit	$ 116	—

Other Fees and Charges:	Assessment	Each Semester	Total for Year
Challenge Exam	Per Credit	$ 23	—
Graduation Fee	One Time	$ 90	—
Installment Payment Plan (Application Fee)	Each Year	$ 50	—
Late Registration Fee	Per Semester	$ 10	—
Medical Technology Fee (During Clinical Training)	Per Semester	$ 458	$ 916
Music Major Fee	Per Semester	$ 20	$ 40
New Student Orientation Fee	One Time	$ 60	—
Nurses Professional Liability Insurance	Per Year	—	$ 15
Replacement of Lost ID cards	Each	$ 5	—
Returned Check Charge	Each	$ 20	—
ROTC Uniform Deposit	One Time	$ 25	—

Students are advised to request a refund of credit balances in their accounts should they desire a refund.

Payment of Charges

Prior to the beginning of each semester, invoices listing all current semester charges and approved financial aid are mailed to all registered students.

Payment of tuition and fees is due by the first day of the semester.

Any indebtedness to the University which becomes past due jeopardizes the student's enrollment and such students shall not be permitted to register for the subsequent semester or summer-school term. Further, students who fail to pay all indebtedness to the University shall not be permitted to receive any degree, certificate, or transcript of grades. Nor shall they participate in Commencement activities.

All payments are made directly to the Financial Management Office. Questions concerning charges or payments should be directed to the Coordinator of Student Accounts in the Financial Management Office.

Fall and Spring Full-time Tuition

Current policy requires that the entire unfunded cost of full-time tuition and fees be paid before the start of the semester. The unfunded cost of tuition and fees represents the net balance due after financial aid has been deducted from the current semester charges. The following three options are available for settlement of the unfunded semester charges:

1. Payment in full
2. Enrollment in the IPP
3. Knight Tuition extended payment plan.

Options 2 and 3 are discussed below.

Summer, Fall and Spring Part-time Tuition

Charges for summer and/or part-time tuition and fees must be paid in ful on or before the first day of classes unless covered by the deferred employe reimbursement policy. The deferred payment policy is described below.

Intersession Tuition

Tuition charges for intersession semesters must be paid in full on or befor the first day of class. The deferred payment option does not apply to inte session charges.

Deferred Payment Policy (Employer Reimbursed)

Deferred payments for employer reimbursement and responsible thi party payor arrangements will be permitted provided the student makes a plication and receives approval before the first day of classes for each s mester. Graduating seniors are not eligible for the deferred payment optio

Monthly Payments

Wilkes has developed an interest-free, ten-month installment payme plan (IPP) to help ease the burden of financing an education. Arrangeme may be made to finance any amount between $2,000 and the full cost tuition and fees. Payments begin in July and end in April of each academ year. IPP applications for the upcoming academic year are available in Ap of each year.

Two additional extended payment plans are available through the Knig Insurance Company. The **SCHOOL CHEX** plan allows parents to borr from a prearranged line of credit and use special checks to pay the Colle bills when they become due. The **EXTENDED REPAYMENT PLAN** is insured loan program which allows for the payment of educational expens over a period of 10 years. Parents may use these programs to cover all part of the costs of education at Wilkes University and can select the ann amount and the number of years of education to finance. For further inf mation, including application procedures, write or call the Knight Tuit Payment Plans, 53 Beacon Street, Boston, Massachusetts 02108. Telepho (617) 742-3911.

VISA/MasterCard

Wilkes University accepts VISA and MasterCard for tuition and fee p ments.

Tuition Discounts

Various tuition discounts are available to Wilkes students who meet eligibility requirements. For application procedures, contact the Financial Aid Office.

Alumni Discount: Alumni qualify for a 10% discount on tuition for undergraduate and graduate courses. A written request for this discount should be submitted to the Financial Aid Office at the time of registration.

Alumni Dependent Discount: A 10% tuition discount is given to dependent children and spouses of Wilkes alumni. This discount applies only to those undergraduates enrolled full-time.

Evening Student Discount: Certain full-time, evening-school students who are also employed full-time may qualify for this discount.

Multiple Student Discount: When two or more members of the same family attend Wilkes at the same time on a full-time basis, a 15% reduction in net tuition is given to all but the first family member.

Patrolman's Benevolent Association Discount: A 15% tuition discount is provided for children of members of New York's Patrolman's Benevolent Association. An additional 5% is provided for students who graduated in the top 5% of their high school class.

Tuition Exchange

Wilkes University is a member of the Tuition Exchange Plan which provides limited opportunities for faculty children from one college or university to enjoy tuition remission benefits at another institution. Students who are dependents of faculty and administration should consult the Tuition Exchange Liaison Officer at their home institutions to determine if they qualify for this program.

Refunds

Students who officially withdraw from courses may be eligible for a partial refund of tuition charges. Resident students who withdraw from the University may also qualify for a refund of meal charges. Refunds are based on the official date of withdrawal as noted by the Registrar.

Any reduction in charges may affect financial aid received for that semester. (See Refund of Financial Aid in the **Consumer's Guide to Financial Aid, Costs, and Charges at Wilkes University**, which is available at the Financial Aid Office.)

Students suspended from the University for disciplinary reasons will forfeit all refunds.

Refunds are available as indicated on the following chart:

Refund Schedule*

Circumstance	Time of Withdrawal	Refund
Academic Year:		
Tuition:		
Total Withdrawal	First Two Weeks	80%
	Third & Fourth Weeks	60%
	Fifth Week	40%
	After Fifth Week	No refund
Full-time to Part-time and Reduction of Part-time Load	Above time-schedule applies for courses dropped	Charges based on the number of credits after the withdrawal
Room and Board:		
Room	Anytime during the 15-week semester	No refund
Board	Anytime during the 15-week semester	Prorated from end of official withdrawal we
Summer Sessions	First week of First or Second Sessions and first two weeks of Evening Session	50%
	After stated period	No refund
Weekend College	Through second weekend	50%
	After second weekend	No refund

*Fees are non-refundable.

Financial Aid

Wilkes University maintains an extensive program of financial assistan for its students in the form of scholarships, grants, loans, and part-time e ployment. To assist qualified students, the University receives substant gifts each year from friends and alumni. These funds, combined with thr furnished by the federal and state governments, are offered to students financial aid packages. All applicants should also apply for financial ass tance, both need-based and achievement-based.

Students with questions about financial aid or students seeking appli tions for financial aid should contact the Financial Aid Office. More d tailed information regarding the financial aid programs and requirement included in the **Consumer's Guide to Financial Aid, Costs, and Char at Wilkes University,** which is also available at the Financial Aid Offic

Application Procedures

1. Submit the Wilkes University Application for Financial Aid to the Wilkes University Financial Aid Office.

2. Complete the PHEAA/Federal Student Aid Application and forward it to PHEAA, Harrisburg, PA. The University code is 010204.

3. Students who are not residents of Pennsylvania but whose home state allows their scholarship/grant funds to be used in Pennsylvania must also complete the appropriate state Financial Aid Form (FAF) and forward it to the University Scholarship Service. The Wilkes University code is 2977.

4. Students who desire to participate in the Stafford Loan (G.S.L.) and/or the PLUS/SLS Program must also complete the appropriate loan application.

Renewal of Financial Aid

Financial aid is awarded on an annual basis; therefore, students must reapply each year. In addition to showing continued financial need, students must also meet specific academic progress requirements to qualify for renewal. These requirements are explained in detail in the **Consumer's Guide.**

Types of Financial Aid

Financial aid packages are developed for students on an individual basis and usually consist of one or more of the following types of aid.

Scholarships: Outright gift assistance that is not repayable by the recipient and is usually based on factors other than demonstrated financial need. In addition to those scholarships listed on the chart on page 46, Wilkes University is approved to participate in PHEAA's Scholars in Education Program and in the Federal Congressional Teachers' Scholarship. Also, several academic units at the University have scholarships available to qualified students. These include the School of Business, Society and Public Policy and the School of Science and Engineering as well as the Athletic Department (wrestling only); Biology Department, English Department, History Department, Music Department, Nursing Department, Political Science Department and the Sociology Department.

Grants: Outright gift assistance that is not repayable by the recipient but is based on demonstrated financial need of the applicant and the family. Many states in addition to Pennsylvania provide financial assistance in the form of grants for residents of their states. Residents of states other than Pennsylvania should contact their high school guidance office for information pertaining to that particular state's aid program. These states include Connecticut, Delaware, Maryland, Massachusetts, Ohio, Rhode Island, Vermont, and West Virginia.

Loans: Financial assistance for which the recipient assumes the obligation to repay the amount of the funds received. Most educational loans provide for payment of principal and interest to begin sometime after the student graduates or stops attending an approved institution on at least a half-time basis. Repayment of the PLUS/SLS and the PHEAA Alternate Loan begin within a short time after funds are disbursed. Two emergency loan funds have been established at the University to help students meet small financial emergencies. The Florence and Joseph A. Goldman Loan Fund and the Robert W. Hall Student Loan Fund provide small interest-free loans which are to be repaid at the earliest practical time, usually 30 days, so that other students may receive needed assistance from these revolving loan funds.

Employment: Financial assistance that a student may earn by working on campus in part-time or full-time positions and for which the student is paid in the form of a monthly check. Students should inquire about these opportunities at the Financial Aid Office. The Office of Career Services also operates a JOB LOCATION DEVELOPMENT PROGRAM (JLD) to help students obtain employment opportunities off-campus. Students are paid by the employer for whom they work.

Veterans Assistance Programs (VA)

This special program provides a wide range of benefits to those who have served in the Armed Forces and in some cases to the dependent children of veterans. Interested persons should contact their local VA Office to obtain information concerning GI Education Assistance, Veterans Education Programs, Veterans Rehabilitation, Veteran Educational Loans, the Veterans Work-Study Program, and other sources of Veterans Assistance. The University also has a Veterans Affairs Office to assist students in obtaining benefits.

Financial Aid for Part-time Students

The Pell Grant, Stafford Loan (G.S.L.), PLUS/SLS Loan, and the PHEAA-HELP Alternate Loan are available to part-time students. Interested students must complete the PHEAA/Federal Student Aid Application and the appropriate loan applications in order to apply for these programs. In addition to financial need, eligibility for the Pell Grant program is based on enrollment status. Students registered for at least 6 credits but less than 9 credits qualify for approximately one-half of the full-time award and those registered for at least 9 credits but less than 12 credits qualify for approximately three-quarters of the full-time award. Limited funds from the Supplemental Educational Opportunity Grant (S.E.O.G.) and the Perkins Loan Programs are available to part-time students who demonstrate exceptional financial need.

Financial Aid for Students Seeking a Second Degree

Only the Stafford Loan (G.S.L.), the PLUS/SLS Program, and the PHEAA-HELP Alternate Loan Program are available to students seeking a second degree. Both the PHEAA/Federal Student Aid Application and the appropriate loan application(s) must be completed to determine eligibility for these programs.



Wilkes University Scholarships

Founders of Scholarships

Several thousand friends and alumni contribute to the scholarship fund of the University on an annual basis. Many friends have created scholarships which bear the names of the donors or of persons whom they have memorialized by means of a scholarship.

Endowed Named Scholarships

MOHAMAD ABRAHAM SCHOLARSHIP has been created by a gift to the University made by Mohamad Abraham. Its purpose is to assist Palestinian Arabs, or their descendants, to obtain a college education. To qualify, a student must demonstrate the ability to successfully complete the work of the University and must submit evidence of financial need.

THE BALLET SOCIETY OF WYOMING VALLEY SCHOLARSHIP has been established by members of the Ballet Society of Wyoming Valley. Income from this fund provides scholarship assistance to one or more students majoring in the performing arts and showing financial need.

KEVIN EDWARD BARKER MEMORIAL SCHOLARSHIP was created in 1972 in memory of a former student, Kevin Edward Barker, by his family and friends. This fund provides partial scholarship assistance to a graduate of Wyoming Valley West High School in recognition of high academic achievement and involvement in extracurricular activities.

ETHEL G. AND ALVAN E. BAUM ART SCHOLARSHIP. A scholarship for a creative art student was established in memory of Ethel G. and Alvan E. Baum by Esther and William Davidowitz and friends. Mrs. Baum was an artist and interior designer. Mr. Baum lived his life as an educator. This scholarship in memory of Mrs. Davidowitz's parents is awarded annually.

THE WILLIAM BERNHARD SCHOLARSHIP was established in memory of William Bernhard, a member of the class of 1983, by his family. The scholarship is available to a deserving student(s) pursuing studies in Business. Priority shall be to ROTC student(s), preferably with interest in becoming a pilot. Other desirable characteristics include participation in extra-curricular activities and good academic standing.

THE GENEVIEVE TODD BRENNAN MEMORIAL SCHOLARSHIP was established by her children in recognition of her service to Wilkes as cafeteria manager from 1938 to 1956. This scholarship provides an annual partial grant for a capable and deserving student who demonstrates promise of success in his or her chosen field.

THE ROBERT S. CAPIN SCHOLARSHIP IN ACCOUNTING was established by former students of Professor Capin, many of whom have become certified public accountants and partners in major firms. The establishment of the fund honors Professor Capin's abilities as a teacher as well as his years of service as President of the University. The fund provides annual assistance for students wishing to pursue the study of accounting.

BRUCE R. CARDON AND CHARLOTTE J. CARDON MEMORIAL SCHOLARSHIP is funded by a trust established for the purpose of providing financial aid to those worthy students seeking such assistance. The allocation of the scholarship shall be at the sole discretion of Wilkes officials.

WALTER S. CARPENTER SCHOLARSHIP IN ENGINEERING is awarded annually to high school seniors planning on majoring in Electrical Engineering, Engineering Management, Environmental Engineering, or Materials Engineering at Wilkes. The recipients of these awards are selected by the faculty of the Engineering Department on the basis of the applicants' high school records and Scholastic Aptitude Test scores, without regard to financial need. Scholarships are renewable annually upon recommendation of the Department of Engineering. Interested students should apply in writing to the Chairman, Department of Engineering. Application deadline is March 15.

CLASS OF 1970 SCHOLARSHIP was established by the Class of 1970 to commemorate their 15th anniversary. It will be awarded to a student demonstrating financial need, good character and scholastic aptitude.

CONYNGHAM POST NO. 97, GRAND ARMY OF THE REPUBLIC, DEPARTMENT OF PENNSYLVANIA, SCHOLARSHIP. In 1968, Trustees of Post 97 established a trust at the University, the annual income of which is used to provide partial scholarships for residents of Luzerne County, with preference given to descendants of veterans of the Civil War.

DR. AND MRS. S. M. DAVENPORT SCHOLARSHIP provides partial scholarship assistance to a worthy student enrolled in the medical science field. The scholarship bears the name of Dr. S. M. Davenport, one of the original members of the Wilkes Board of Trustees and former campus physician, and his wife, Mrs. Harriet M. Davenport.

ESTHER AND WILLIAM DAVIDOWITZ SCHOLARSHIP is awarded annually to an outstanding student. The scholarship has been created by Mr. and Mrs. William Davidowitz, long-time friends of the University, who wish to support the endeavors of capable and worthy students.

CHARLES AND SADIE DONIN MEMORIAL SCHOLARSHIP is supported by a substantial endowment created by Mr. Donin. Scholarships are awarded to able and highly motivated students of limited financial means.

THE GEORGE F. ELLIOT MEMORIAL SCHOLARSHIP has been created by faculty, friends, and alumni of the Department of Commerce and Finance in memory of Professor George F. Elliot. Professor Elliot served as a teacher of economics for many years in the Commerce and Finance Department. The award is provided annually to an outstanding student majoring in a field within the Department of Commerce and Finance, preferably economics.

DR. JOHN HENRY ELLIS, IV, SCHOLARSHIP was established with a gift from Dr. John H. Ellis, IV, '79 and awarded to a full-time local student majoring in the sciences who demonstrates financial need.

EUGENE S. AND ELEANOR COATES FARLEY SCHOLARSHIP was created by gifts from friends and family in memory of the first president of Wilkes University and his wife, whose dedication and commitment to Wilkes and the community have contributed so much to the development of both. A partial tuition scholarship is awarded annually to a qualified student active in campus athletic or cultural programs.

THE CHLORA FEY SCHOLARSHIP has been established by members of the former Chlora Fey Console Club in honor of the organization's founder and advisor, the late Miss Chlora Fey, who was a prominent organ and piano teacher in the Hazleton area. Students pursuing the study of organ will be required to present themselves for audition, at which time selected faculty of the Music Department will assess their ability and subsequently select one applicant as the recipient of this partial annual scholarship award.

THE FORTINSKY SCHOLARSHIP was established in 1978 by Robert Fortinsky and is awarded annually to a capable student demonstrating promise and ability.

SIDNEY AND PAULINE FRIEDMAN SCHOLARSHIP was created by a gift from the Friedmans for students majoring in art. Awarded to a highly motivated freshman with financial need.

WILLIAM R. GASBARRO SCHOLARSHIP remembers Professor Gasbarro for his service as Chairman and member of the music department extending over three decades. To be awarded to an undergraduate student(s) of music demonstrating financial need and academic ability.

THE MILDRED GITTINS MEMORIAL SCHOLARSHIP was established by the University in 1983. It recognizes a record of service for four decades by Miss Gittins, who served as manager of the bookstore. This partial scholarship award is provided annually to a student demonstrating scholarship and leadership abilities and financial need.

BRYNLY R. GRIFFITHS SCHOLARSHIP is to be used for the financial aid of deserving students of vocal music.

MARGARET MARY HAGELGANS MEMORIAL SCHOLARSHIP was established by her parents to remember Margaret Mary Hagelgans, a member of the Class of 1986.

KLAUS HOLM SCHOLARSHIP, established by students, colleagues and friends, honors Professor Holm for his service to theatre arts. To be awarded to a student of the dramatic arts demonstrating financial need and scholastic aptitude.

ARTHUR J. HOOVER SCHOLARSHIP was established by friends and family in memory of Dean Hoover, a member of the Class of 1955 and the Administration for 31 years. To be awarded to a student demonstrating financial need, good character and scholastic aptitude.

JEWISH WAR VETERANS, WILKES-BARRE POST 212 SCHOLARSHIP is established in honor of B. J. Levin, one of the Post's founders. The purpose of this scholarship is to aid the son or daughter of a local war veteran. The award is made on the basis of need and ability without regard for race or creed.

WILLIAM D. JONATHAN MEMORIAL SCHOLARSHIP has been established by friends of William D. Jonathan in recognition of his selfless courage in the line of duty and his life's interest in improving fiscal management in state and local government. Mr. Jonathan, a senior research associate with the Pennsylvania Economy League for over 20 years and a volunteer firefighter from Nanticoke, Pennsylvania, lost his life in a tragic fire in Nanticoke in December of 1978 as he attempted to save the life of another firefighter. The award is made annually to a student majoring in political science or economics who has exhibited interest in fiscal management and service to the community.

THE GRACE C. KIMBALL SCHOLARSHIP IN BIOLOGY was created in 1985 in memory of Dr. Grace Kimball, a former faculty member of the Department of Biology. The scholarship is awarded to beginning biology majors who have satisfied qualifying criteria established on a competitive basis by the departmental faculty.

HAROLD J. HARRIS, M.D., AND ANGELINE ELIZABETH KIRBY MEMORIAL HEALTH CENTER SCHOLARSHIP was created in memory of Dr. Harold J. Harris, prominent local physician and long-time president of the Kirby Health Center. This scholarship has been endowed at Wilkes by the Kirby Memorial Health Center and will grant full tuition every other year to a pre-med or nursing student.

KORAL'S FASHION SCHOLARSHIP was established by A. Koral Fashion Inc. and is awarded annually to a deserving student or students from Luzerne County. Preference is given to students pursuing studies in the fields of art and/or business.

THE ESTHER LAMB SCHOLARSHIP was created at Wilkes in 199 from the Esther Lamb Trust which had been established in 1976. Esther Lamb was a Registered Nurse who was interested in helping poor youth from the local area achieve a medical education. This endowed fund will be awarded to financially needy full-time students from Northeastern Pennsylvania who are enrolled in the premedical program at the University. Selection of recipients will be made by the Dean of admissions, Dean of Health Sciences and Vice President for Development.

THE WILLIAM LANGFELDER SCHOLARSHIP was established in 1986 by his sister, Mrs. Julia Hirsch, to provide scholarship assistance for one or more deserving students. First priority will be to students from Mount Carmel, Pennsylvania, area; second priority to students from Northeastern Pennsylvania.

THE ANNE VANKO LIVA SCHOLARSHIP was established by friends and former students of Mrs. Liva in honor of her many contributions to music and to cultural life in Luzerne and Lackawanna Counties. Scholarship(s) will be awarded to an undergraduate majoring in music, with preference given to students specializing in the study of piano.

THE CHARLOTTE V. LORD SCHOLARSHIP was established by colleagues, friends, and students of Dr. Lord in recognition of her unique career in education, in the arts and literature, and for her contributions to the community. The award is made annually to one or more students majoring in the fine arts and humanities.

THE KATHRYN H. MacAVOY SCHOLARSHIP IN NURSING was established in honor of Kathryn H. MacAvoy, a long-time resident of Wilkes-Barre and a member of the nursing profession, by her nephew Edwin Mailander. The fund provides at least one, but not more than two partial scholarship grants annually to a student or students from the Greater Wyoming Valley who demonstrate need and capability in the pursuit of the study of nursing.

THE KATHLEEN HARTZELL MAILANDER SCHOLARSHIP IN NURSING was established in memory of Kathleen Hartzell Mailander, a long-time resident of Wilkes-Barre and a member of the nursing profession, by her son, Edwin Mailander. The fund provides at least one but not more than two partial scholarship grants annually to a student or students who demonstrate need and capability in the study of nursing. Preference for recipients of the scholarship shall be given to residents of the Greater Wyoming Valley.

ARNAUD CARTWRIGHT MARTS SCHOLARSHIP was created by the associates of Dr. Arnaud C. Marts, in the firm of Marts & Lundy, to honor the chairman of their company.

As president of Bucknell University, Dr. Marts was instrumental in the establishment of Bucknell University Junior College, which became Wilkes College in 1947. After Wilkes became an independent college, he joined its Board of Trustees and was elected vice-chairman of the Board.

The Arnaud C. Marts Scholarship is awarded each year to the outstanding senior who has need of financial aid and who, by high scholarship and participation in college activities, has demonstrated those qualities of leadership that are needed at Wilkes and in the nation.

FRANCES AND LOUIS MASLOW MEMORIAL SCHOLARSHIP has been established through the generosity of Frances and Louis Maslow, long-time friends and benefactors of Wilkes, and in cooperation with their son, Richard Maslow, a former member of the Wilkes Board of Trustees. The fund provides for scholarship aid to be awarded annually to a worthy student majoring in engineering or business administration.

ROBERT J. McBRIDE MEMORIAL SCHOLARSHIP was established to honor the memory of Robert J. McBride, an athlete at Wilkes. Initial funding of the scholarship came from donations received at the time of his death.

THE RUTH W. AND JOHN T. McHENRY SCHOLARSHIP IN NURSING has been created by faculty, alumni, and friends of the Nursing Department in recognition of the outstanding leadership exhibited by Ruth McHenry in founding the baccalaureate degree program in nursing at Wilkes, and in recognition of the personal encouragement of this effort by her husband, John McHenry. A scholarship grant is awarded annually to a student or students selected by the faculty of the Department of Nursing and the Director of Financial Aid in recognition of demonstrated academic, professional, and leadership abilities in the field of nursing. Particular consideration will be given to students who, in the view of the nursing faculty, are potential leaders for the profession of nursing in the Greater Wyoming Valley area.

THOMAS J. MORAN SCHOLARSHIP IN JOURNALISM. Funded by the Capital Cities/ABC Foundation and The Times Leader, this scholarship honors the career achievements of Thomas J. Moran, President of Luzerne County Community College. The scholarship will be available to qualified students who earn the associate degree or equivalent at LCCC and will pursue the baccalaureate degree at Wilkes. It will also fund a paid internship at The Times Leader to lend practical application of skills in a professional environment.

DR. JAROSLAV G. MORAVEC MEMORIAL SCHOLARSHIP has been established for a student genuinely interested in sociology and anthropology who intends to pursue graduate studies in sociology, anthropology, law, or an allied field. Beginning in 1978-79, this scholarship has been awarded to a student for use during his/her senior year.

MABEL AND JOHN C. MOSTELLER SCHOLARSHIP has been created to provide scholarships for needy and intelligent young men who have insufficient financial resources of their own and who would not have the opportunity to attend college if they were unable to secure financial assistance. The scholarships shall be granted only to young men of good moral character who are in the upper ten percent of their class in academic standing and who have passed a qualifying competitive examination administered by Wilkes University.

THE TAFT ACHILLES ROSENBERG NAPARSTECK SCHOLARSHIP was established by Ruth and Martin Naparsteck, '69, in memory of their son, Taft. Although he died ten days before his second birthday, Taft was already able to do some reading and writing. The scholarship provides assistance for a student who shows promise as a writer of prose fiction, journalism, or poetry. Preference may be given to a veteran of the Viet Nam War or to the son or daughter of a veteran of that war.

THE NESBITT MEMORIAL HOSPITAL SCHOLARSHIP. This program provides a maximum of $2,000 per year in the form of a scholarship loan to a nursing major and is available for four years. Upon graduation, the student is guaranteed employment at Nesbitt Hospital. Financial support received is forgiven for each year of employment at the hospital. If the graduate does not choose to work at Nesbitt, the aid is repayable as a loan.

THE ELLEN WEBSTER PALMER SCHOLARSHIP was established in memory of Mrs. Palmer, founder of the Boys Industrial Association of Wilkes-Barre. Income from the fund is to be distributed for scholarship purposes. Preference for the award shall be: first, to student(s) whose forebears include one or more "breaker boys" employed in the mining industry; second, to student(s) from Luzerne County; third, to all other Wilkes University students.

THE PEKING CHEF SCHOLARSHIP FOR INTERNATIONAL UNDERSTANDING was established through the efforts of Mr. Eric Lee on the occasion of the tenth anniversary of his Wilkes-Barre restaurant. An award is made annually to a Pennsylvania student interested in studies and/or activities promoting greater understanding of our global society — its politics, cultures, languages and religion.

PENNSYLVANIA INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS — NORTHEAST CHAPTER has created partial tuition scholarships for accounting students entering the senior year, in recognition of high academic endeavor in the study of accounting.

CRAIG C. PIATT MEMORIAL SCHOLARSHIP was established in 1988 in memory of Craig Piatt, of the class of 1991, a student of business administration and a member of the football team. The scholarship is awarded to a student demonstrating financial need and showing scholastic aptitude.

HENRY BLACKMAN PLUMB AND EDITH PLUMB SCHOLARSHIP has been established to provide scholarships for students of outstanding ability and character majoring in one of the sciences and attending Wilkes University.

KENNETH L. POLLOCK SCHOLARSHIP provides partial scholarships for two seniors from Northwest Area High School who matriculate at the University. The recipients are determined by a selection committee of interested individuals from the Northwest Area. Further information concerning application procedures and eligibility requirements is available from the Director of Guidance, Northwest Area High School.

GEORGE AND HELEN RALSTON SCHOLARSHIP, established by friends and family, honors Dean Ralston for his forty years of service to Wilkes, and Mrs. Ralston, a member of the Class of 1952. To be awarded to a student demonstrating financial need, good character and scholastic aptitude.

THE CHARLES B. REIF SCHOLARSHIP FOR THE BIOLOGICAL SCIENCES was established by former students of Dr. Reif, many of whom are physicians, dentists, researchers, and teachers. The establishment of the fund recognizes his many years of service as professor of biology and chairman of the Biology Department. Scholarships are provided annually for students who wish to pursue the study of the biological sciences.

THE LILLIAN WILKINS RINEHIMER R.N. SCHOLARSHIP. This scholarship, established by her sons, remembers Mrs. Rinehimer who was one of the earliest registered nurses in the Commonwealth of Pennsylvania and served the Wilkes-Barre area for many years as a visiting nurse. Preference shall be to a student demonstrating financial need and scholastic aptitude.

THE DR. SAMUEL A. ROSENBERG MEMORIAL SCHOLARSHIP has been created in memory of Samuel Rosenberg, who served as professor of economics and chairman of the Department of Commerce & Finance at Wilkes for many years. Dr. Rosenberg was respected as teacher, administrator, and labor-relations specialist. His work in the latter field related not only to recognition in the community, but also to distinguished service with agencies of the United States government. The award is provided annually to an outstanding student majoring in a field within the Department of Commerce & Finance.

THE SIDNEY AND THEODORE ROSENBERG SCHOLARSHIP created by Sidney and Theodore Rosenberg of California, provides annual income to be distributed to capable and deserving students who elect to study at Wilkes University.

AMEDEO OBICI AND THOMAS P. SANGIULIANO SCHOLARSHIP is awarded to a member of the sophomore class who is a student in drama with an interest in English classical theater. The recipient must demonstrate financial need as well as an aptitude for scholarship.

ROBERT MARC SCHUB MEMORIAL SCHOLARSHIP was established by Mr. and Mrs. Marvin Schub in memory of their son. This scholarship is to be awarded to a local student, preferably studying in the area of the humanities or sciences, who otherwise could not attend college. The scholarship is awarded annually to a worthy student of high potential.

THE FRANCES D. SHOTWELL MEMORIAL SCHOLARSHIP was established by the bequest of Mrs. Shotwell and by designation by her daughter Sandra H. Shotwell, a member of the Class of 1979. The scholarship will be awarded annually to a student demonstrating financial need and studying music, with preference to a student majoring in voice.

THE SAMUEL H. SHOTWELL MEMORIAL SCHOLARSHIP was established by a bequest of his wife, Frances D. Shotwell. The scholarship is awarded annually to a student demonstrating financial need and pursuing the study of engineering.

THE MARK SLOMOWITZ MEMORIAL SCHOLARSHIP was established by Mr. and Mrs. A. David Fried in memory of their grandson. The scholarship is awarded to a student exhibiting outstanding academic promise and majoring in the social sciences, preferably economics, a field of study which interested Mark.

MERRITT W. AND MARJORY R. SORBER SCHOLARSHIP was established with gifts from the children of Mr. and Mrs. Sorber. First preference shall be to graduates of Northwest Area High School, second to students from Hanover Township High School, third to those from other Luzerne County High Schools.

SURDNA FOUNDATION SCHOLARSHIP was established in 1987 as a result of the Alumni of Wilkes successfully meeting a challenge giving goal offered by the Foundation. To be awarded to a student who demonstrates financial need, good character and academic aptitude and is also the son or daughter of a member of the alumni body.

THE CROMWELL E. THOMAS OUTSTANDING FRESHMAN SCHOLARSHIP was established by friends and former students of Professor Thomas in recognition of his dedicated service to Wilkes as wrestling coach, member of the faculty, advisor and friend to many students. To be awarded for the sophomore year to the outstanding freshman wrestler as chosen by the coaching staff and Athletic Director.

THE REED P. AND DOROTHY TRAVIS MEMORIAL SCHOLARSHIP was established by family and friends in recognition of their outstanding service to the Wilkes-Barre Area Community. This scholarship provides an annual partial grant for a capable and deserving day student from the Greater Wyoming Valley Area who best exemplifies the unselfish and giving spirit of the late Mr. Travis.

FRANCIS A. UMPHRED MEMORIAL SCHOLARSHIP, established in 1973 by members of the University administration, is awarded to a capable student demonstrating leadership and ability during each academic year.

ESTHER WECKESSER WALKER SCHOLARSHIP was created by Mrs. Walker to assist students of outstanding promise and achievement during their junior and/or senior years.

MYVANWY WILLIAMS THEATER SCHOLARSHIP is awarded to a student who has demonstrated outstanding interest and ability in drama.

THE IRA B. ZATCOFF MEMORIAL SCHOLARSHIP was established by Samuel and Joseph Zatcoff, successful businessmen in the Greater Wilkes-Barre area, in memory of their nephew Ira B. Zatcoff, who was a

long-time friend of Wilkes. The fund provides an annual grant to assist a capable and deserving student from the Greater Wyoming Valley area, with preference given to the selection of a student interested in business or economics.

EMORY AND MAMIE ZIEGLER SCHOLARSHIP provides a full-tuition scholarship to a deserving member of the Catholic, Jewish, and Protestant faiths who are residents of Wyoming Valley. Selection is made by a special committee of the counseling deans of Wilkes University.

Annual Named Scholarships

THE BOSCOV'S AND ALEXANDER W. DICK FOUNDATION SCHOLARSHIP, established by Albert Boscov, president of Boscov's Department Stores, is awarded annually to assist capable and worthy students. The scholarship is funded through direct contributions from Boscov's Department Stores and grants from the Alexander W. Dick Foundation. Mr. Dick was a founder of Fowler, Dick and Walker Stores, predecessor to the Wilkes-Barre and Hazleton Boscov's Stores. Minimum scholarship awards of $500 will be granted annually to a student or students who demonstrate ability and need. Preference will be given to qualified individuals who are sons or daughters of employees of Boscov's Department Stores. In this case, the parent must have been employed by Boscov's for at least five years and must be employed as of February prior to the fall semester enrollment of the son or daughter. Students wishing consideration for this scholarship must so specify at the Office of Financial Aid.

ELKAY INDUSTRIES, INC. SCHOLARSHIP, established by Elkay Industries, Inc., provides one or more, but no more than three, scholarships for qualified and deserving students of Wilkes University. Preference shall be given to sons, daughters, or spouses of employees of Elkay Industries, Inc. If no qualified applicants are available in any year, the funds shall be used for general scholarship purposes.

FRANKLIN FIRST FEDERAL SAVINGS AND LOAN ASSOCIATION OF WILKES-BARRE awards a partial scholarship to a student of scholastic achievement who is active in campus and community activities.

INTERMETRO INDUSTRIES provides scholarship funds for sons or daughters of its employees. To qualify for candidacy, a student must apply through the regular admissions channels of the University and be accepted by Wilkes for full-time enrollment. Interested students should contact the administrative office of InterMetro Industries.

LAVENTHOL & HORWATH SCHOLARSHIP is presented annually to a senior accounting major by the firm of Laventhol & Horwath in recognition of high academic endeavor.

THE LESLIE FAY SCHOLARSHIP is granted each year to sons or daughters of employees of the company who present outstanding credentials and demonstrate need. Recipients of the scholarship will be selected by the director of Financial Aid of Wilkes University. The scholarship will be retained by the student for the four years in college provided his or her achievement is consistent with University standards; the amount of the scholarship will vary according to the number of recipients in any given year as well as the resources available.

LETTERWOMEN'S CLUB annually awards a partial scholarship to a Letterwoman selected by the organization.

PENNSYLVANIA MILLER'S MUTUAL INSURANCE COMPANY awards a partial tuition scholarship to a student who has demonstrated outstanding ability in studies and in student activities.

THE POLISH ROOM COMMITTEE SCHOLARSHIP was established in 1972 to express appreciation of services rendered to Wilkes and the community of Northeastern Pennsylvania by Dr. and Mrs. Joseph J. Kocyan. Several scholarships are awarded annually to upperclassmen of Polish descent with exceptionally high cumulative grade point averages. The Director of Financial Aid, Dean of Admissions, and a member of the Scholarship Committee select qualified students and award the scholarships.

PRUDENTIAL BACHE awards a partial tuition scholarship to a worthy junior or senior of outstanding ability majoring in business or finance.

A. RIFKIN AND COMPANY awards a partial tuition scholarship to a worthy young man or woman of outstanding scholastic ability.

WILKES-BARRE ROTARY CLUB SCHOLARSHIP, established in memory of Willits Coleman, a member of the Wilkes-Barre Rotary Club, is awarded to a senior who has demonstrated ability in the classroom and in student activities.

WILKES UNIVERSITY FACULTY WOMEN'S CLUB SCHOLARSHIP is given in memory of Eleanor Coates Farley and awarded annually to a female student in need of financial support.

Summary of Financial Assistance Programs*

Program	Average Annual Award	Application(s) Required	Filing Deadline
		SCHOLARSHIPS	
Trustee Scholarships	$6,272	PHEAA/Federal Student Aid Application and	Upperclass student deadline — May 1, 1990
Presidential Scholarships	$1,644	Wilkes Financial Aid Application	Incoming student deadline varies —
Dean's Scholarships	$ 500		Contact Wilkes Admissions Office
Academic Recognition Scholarships	$1,141		
Leadership Scholarships	$1,529		
Room & Board Scholarships	$3,278		
Wilkes Named Scholarships	$1,030		
Transfer Student Scholarships	$ 613		
ROTC Scholarships	$7,600	Contact the Wilkes ROTC Office	Contact ROTC Office
		GRANTS	
Pell Grant	$1,468	PHEAA/Federal Student Aid Application or CSS's FAF or Federal Student Aid Application	May 1, 1991
PHEAA Grant	$1,623	PHEAA/Federal Student Aid Application	May 1, 1990
SEOG Grant	$ 706	PHEAA/Federal Student Aid Application and	Upperclass student deadline — May 1, 1990
Wilkes Need-Based Grant	$1,307	Wilkes Financial Aid Application	Incoming student deadline — Rolling basis as
Wilkes Act 101 Grant	$1,693		long as funds are available
Office of Vocational Rehabilitation Grant	$5,078	Contact the Office of Vocational Rehabilitation	Contact Office of Vocational Rehabilitation
		LOANS	
Carl Perkins Loan (NDSL)	$1,310	PHEAA/Federal Student Aid Application and	Upperclass student deadline — May 1, 1990
Nursing Student Loan	$2,335	Wilkes Financial Aid Application	Incoming student deadline — Rolling basis as
Gulf Oil Loan	$1,000		long as funds are available
Rulison Evans Loan	$1,000		
Stafford Loan	$2,571	Guaranteed Student Loan Application and	Six to eight weeks prior to need for loan proceeds
PHEAA-HELP Stafford Loan	$2,515	PHEAA/Federal Student Aid Application	
PLUS/Supplemental Loan	$3,438	PLUS/Supplemental Loan Application	Six to eight weeks prior to need for loan proceeds
PHEAA-HELP Alternate Loan	$4,176	PHEAA-HELP Loan Application	Six to eight weeks prior to need for loan proceeds
		EMPLOYMENT	
Federal College Work-Study Program	$1,200	PHEAA/Federal Student Aid Application, Wilkes Financial Aid Application, and Wilkes Application for Student Employment	Prior to beginning work on campus
Institutional Employment	$1,200	Wilkes Application for Student Employment	Prior to beginning work on campus

*Detailed information on all financial assistance programs is available in the Consumer's Guide to Financial Aid, Costs, and Charges at Wilkes University.

Student Affairs and Athletics

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Student Affairs and Athletics

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Student Affairs

Wilkes University is a community of learning in which extra-curricular activities complement academic life. Students, faculty and staff work together to promote individual development through a variety of activities, programs, organizations and cultural opportunities. All campus organizations are open to all students, and all of them work in close cooperation with faculty advisors and student affairs staff.

The information which follows gives a brief sketch of some of these activities and organizations. All new students receive a **Student Handbook** which explains student government, outlines University regulations, and provides a directory of student activities.

Student Activities

An active Student Government and numerous campus clubs and special-interest organizations provide a structure of activities for student life outside of the classroom. An Inter-Residence Hall Council and a Commuter Council organize many activities for resident and commuter students, and a Student Programming Board oversees a full schedule of social events at the University.

Students publish the **Beacon**, a weekly newspaper; the **Manuscript**, an annual journal of art, poetry, and fiction; and the **Amnicola**, the University yearbook. The University also maintains an FM radio station, WCLH, which is operated by students and broadcasts daily throughout the Wyoming Valley. Other student activities that provide creative outlets include the theater, the jazz band, choruses, numerous brass, woodwind and percussion ensembles, and an active intercollegiate forensics and debate organization.

Honor Societies

Several chapters of national and international honor societies have been established on the Wilkes campus.

PHI ALPHA THETA, the National History Honor Society, has a chapter at Wilkes University. The local chapter seeks to foster historical awareness by sponsoring programs of scholarly and public interest during the academic year. Membership is open to students who have demonstrated high academic achievement in history.

PSI CHI, the Wilkes University Chapter of the National Honor Society in Psychology, was chartered in 1981. Its purpose is to encourage, stimulate, and maintain excellence in scholarship and research in psychology, thereby advancing the science. PSI CHI is an affiliate of the American Psychological Association and the Association of College Honor Societies. Membership is open to psychology majors and minors who have demonstrated academic excellence, particularly within the field of psychology.

SIGMA PI SIGMA is the National Honor Society in Physics. Its goal is to promote scholarly excellence in and heighten awareness of the field of Physics. Membership in the society is open to students who have demonstrated academic excellence, particularly within the field of Physics.

SIGMA THETA TAU is the international Honor Society in Nursing. ZETA PSI, the Wilkes University Chapter, was officially inducted in 1984. Membership is composed of students in nursing who have demonstrated high scholastic achievement and nurses in the community who have made significant contributions in the areas of nursing service or education.

SIGMA XI, the Scientific Research Society, has established a local affiliate on the Wilkes University campus. The Club serves as a forum for cooperation and exchange of ideas among research-oriented scientists in the area. The Club welcomes as members local collegiate professionals, and industrial researchers engaged in original scientific investigations.

Intramural and Intercollegiate Athletics

Wilkes sponsors an active intramural sports program as well as intercollegiate competition in 14 varsity sports. Varsity programs for women include basketball, field hockey, soccer, softball, tennis and volleyball; men compete at the varsity level in baseball, basketball, cross country, football, golf, soccer, tennis and wrestling. With the exception of wrestling, varsity teams compete at the Division III level; wrestling is a Division I program. The University is a member of the Middle Atlantic Collegiate Athletic Conference (MAC), the Eastern Collegiate Athletic Conference (ECAC), and the National Collegiate Athletic Association (NCAA).

The goal of the intramural program is to provide a comprehensive set of recreational and fitness activities throughout the academic year for the University community. Students, faculty and staff participate in individual, dual and team competitions in the traditional sports as well as in innovative activities like outdoor quad-volleyball, ultimate frisbee tournaments, a home run derby and a non-traditional track meet. Events are organized in full-length seasons, short-term competitions, and one-day special events, using the indoor facilities of the Marts Center as well as the spacious grounds of the Ralston Field Complex.

University Activities

In addition to the curricular and cocurricular activities of particular organizations, a number of all-campus and campus-community events are held each year. Parents' Day, Homecoming, Winter Weekend, and the Cherry Blossom Weekend are typical of the social and cultural events which help to promote an active and involved student body. The University joins area cultural groups each year for the annual Cherry Blossom Festival and for the Fine Arts Fiesta, a four-day festival of music, drama, and the arts

presented each spring. A carefully selected Concert and Lecture series is presented throughout the academic year at Dorothy Dickson Darte Center for the Performing Arts and is open to the campus and to the community without charge, as are regular concerts and recitals.

Student Services

Wilkes takes seriously its commitment to encourage students to discover their own abilities and potential and to assist them in making sound, independent decisions. Students are expected to consult regularly with classroom instructors, faculty advisors, the student affairs deans, department chairpersons, or academic deans regarding academic matters. Recognizing that students sometimes need additional guidance in resolving personal, social or academic problems, the University has also institutionalized a variety of programs to assist students, individually and in groups.

New-Student Orientation Program

The transition from the directed work of the high school to the independent and more intensive work of the university is smoothed by introducing new students to the University and its services before classes formally begin. Two orientation periods during the summer and the days preceding the start of the term are set aside to assist new students in planning their academic programs and learning about the campus, the curriculum, and student activities. At this time, students are also introduced to their academic advisors and briefed on the advising system.

Student Advisement

Specially selected faculty members and administrators have been designated freshman advisors on the basis of their knowledge of curricular matters and, more generally, the University and its services. Each freshman is assigned to a freshman advisor during the orientation period and will meet with this advisor regularly to arrange schedules, discuss academic and career plans, and deal with problems or questions as they arise. These faculty advisors add the special expertise of their disciplines to the advising process. If the student has indicated a major at admission, he or she will be advised by a freshman advisor from the relevant department or program, from the start of his or her studies. Students who are undeclared with regard to their major work with their assigned freshman advisor until they decide on their major; they then shift to a departmental advisor.

International Student Advisor

The International Student Advisor provides immigration and visa information and assistance as well as advice on academic concerns and personal issues. The Advisor provides orientation to life in the United States and the American educational system; serves as the spokesperson for international students in dealings with U.S. and foreign government agencies, other campus offices and departments, and the community; and serves as advisor to the International Student Organization. These services are available to all international students, non-immigrants and immigrants alike.

Special Advising and Counseling Services

Due to the intricacies of certain programs or requirements imposed by professional and graduate schools or external accrediting agencies, the University has named advisors in special areas of interest. The Dean of Health Sciences and specially trained pre-medical advisors function as special advisors to all students interested in professional or graduate school opportunities in medical or health-related fields. The Pre-Law Advisors work with students from any discipline who wish to go on to law school. The International Studies Advisors counsel students in matters relating to studying abroad and career and professional opportunities in this field. The Coordinator of Cooperative Education counsels and advises students interested in this program or a variety of other internship possibilities. Information on any of these special services is available at the Registrar's Office and the Office of Student Affairs.

The Student Affairs Office

The student affairs staff helps students with their personal or educational problems, handles student emergencies, works with students who have been referred to them by other members of the campus community, and provides general information about campus and community resources. The Dean of Student Affairs is generally familiar with all University services and specifically coordinates the activities of the residence-life staff and the Coordinator of Student Activities as well as the Health Service, Counseling Service, Testing Service, Office of Career Services, and Office of Cooperative Education.

Health Service

The Health Service Office is staffed during normal campus hours by a registered nurse. Appropriate referrals to area doctors and hospitals are made as necessary. Group Health insurance is available through the University.

Counseling Service

The Counseling Service is available to individual students during normal class hours and at other times, as necessary, to discuss personal problems or concerns. Referrals to campus and area agencies and professionals are made when appropriate. The Director of Counseling also works closely with all

student groups and University personnel to provide timely workshops and group sessions on areas of interest or concern such as assertiveness training, time management, or health-related topics.

Testing Service

The Testing Center provides its services on referral from academic advisors and student affairs deans. The Testing Service is also available, at no charge, to all current Wilkes students as well as alumni and their families. The Center also provides services to business, industry, state and federal agencies for a fee.

Career Services

The Office of Career Services is the liaison between the University and potential employers in business, industry, government, and educational institutions. Various services are offered to assist students at all stages of their career development. No appointment is usually necessary and students are encouraged to participate in this service program by registering at the Max Roth Career Center at 215 South Franklin Street.

Typical services of the Office include career counseling, workshops on resume preparation, interviewing skills, and job search strategies. In addition, the Career Services Office provides a credentials service for all registered candidates, maintains contact with professional and educational organizations through an on-campus recruiting program, and shares job information on various full-time and part-time opportunities of interest to students and alumni. Cooperative Education internships for academic credit and institutional work/study jobs are also available to qualified students. However, first-year students are particularly advised not to consider part-time employment until they have had an adequate opportunity to determine the time needed to meet academic requirements fully.

Flexibility and planning are essential for choosing a major and determining career goals. A Career Resource Library is available to identify a variety of career options for students in any major, and the Career Services Office exists to help the student effectively negotiate these and other career planning tasks.

Each year Wilkes participates in CAREER DAY, a program sponsored jointly by area colleges during the fall semester. At this event, approximately one hundred organizations send employer representatives to meet with students about available career opportunities. In addition, CAREER EXCHANGE, a program sponsored each spring semester, allows students to meet with Wilkes Alumni and conduct information interviews to facilitate career planning.

Registrants are urged to update their credentials file regularly and to maintain contact with the Office regarding their career activities.

Learning Center

The Learning Center provides free tutorial services in all courses to Wilkes students. Services include individual tutoring in any course, group study sessions, small group supplemental instruction seminars, and assistance in basic skills. During the summer, the Center offers the five-week STEP Program, which is designed to help entering students improve their English, reading and study skills, and prepare for college-level courses in Mathematics, Biology and Chemistry. STEP is the acronym for Success Through Early Preparation.

Writing Laboratory

The Writing Laboratory is available to all Wilkes students who seek personal assistance with particular writing problems or particular writing assignments. Students who experience writing difficulties in courses may be referred to the Laboratory to hone their writing skills.

Act 101 Program

The Act 101 Program allows educationally underprepared students to improve their skills in verbal and written communication, reading comprehension, mathematics and problem solving in an effort to acquaint students with and help them adjust to the many new experiences provided by a university education.

Project Upward Bound

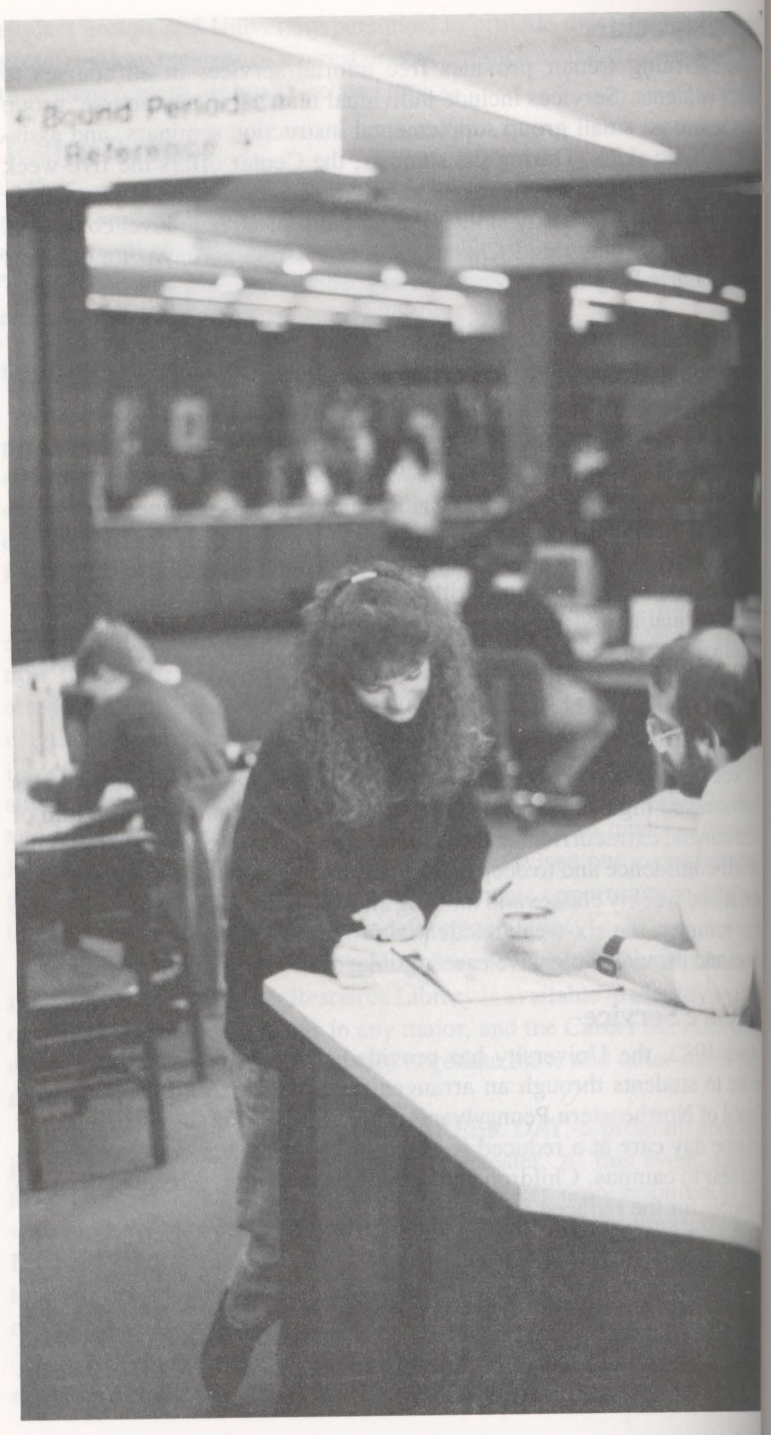
A federal program at Wilkes since 1967, Project Upward Bound provides disadvantaged high school students with a college preparatory program of curricular and extracurricular activities designed to improve academic skills and self-confidence and to deepen curiosity and human understanding. Students attend weekly classes and tutoring and counseling sessions on campus. In the summer, the six-week residential program prepares students for fall classes and provides intensive career guidance.

Day Care Service

Since 1982, the University has provided partially subsidized day care service to students through an arrangement with the Child Development Council of Northeastern Pennsylvania. The service offers regular full- and part-time day care at a reduced fee to students at centers conveniently located near to campus. Children must attend on a regular, scheduled basis to be eligible for the reduced fee.

Bookstore

The Bookstore sells new and used books, stationery and supplies, and memorabilia during normal class hours, and it is open for additional hours at the beginning of each term. The bookstore accepts cash, personal checks (with appropriate identification) and Visa or MasterCard.



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Academic Information

Calendar

The academic year consists of two semesters. The fall semester normally begins in early September and concludes with final examinations in December. The spring semester begins in late-January and closes with a final examination period in May. Commencement exercises are scheduled late in May. A three-week, optional Intersession is offered in January.

The University also provides a broad range of courses in three different summer sessions. The first summer session begins in early June and concludes in mid-July; the second session begins in mid-July and ends in late August. An eight-week evening session complements these two day-school summer sessions; the evening session begins in early June and ends in early August.

Degree Programs

Wilkes offers undergraduate programs leading to the Bachelor of Arts, Bachelor of Science, Bachelor of Fine Arts, and Bachelor of Music degrees. Degree programs have been carefully designed so that students may meet the entrance requirements of graduate and professional schools, but they also are structured to ensure that all Wilkes undergraduate degrees represent the broad and solid base of general education that is central to responsible participation in human affairs. Each degree program is designed to achieve particular educational objectives; however, all baccalaureate programs share a set of distinctive goals, which define the Wilkes approach to baccalaureate education. They include:

1. A commitment to high standards of academic achievement and, thereby, to the integrity of the baccalaureate degree.
2. Completion of an extensive core curriculum in the fundamental fields of the arts and sciences.
3. An instructional approach which defines the student as an active participant rather than a passive observer in the classroom, laboratory, and other learning settings.
4. Curricular and programmatic features which help students integrate theoretical understanding with the application of knowledge in professional and community settings.
5. An approach to curriculum which emphasizes principles, ideas, and analytical procedures that cut across and transcend the boundaries of particular disciplines and facilitate life-long learning.
6. Careful, personalized academic and career advisement to ensure that students pursue coherent programs of study and devote appropriate attention to planning for the transition from university to a career or graduate study.

7. Maintenance of an academic environment which is free from *a priori* commitment to particular ideologies or creeds.
8. Articulation and pursuit of the highest standards of personal integrity and professional responsibility.

The Curriculum

The Wilkes Curriculum has three components. The first is the Core Curriculum, which provides a common foundation in the arts and sciences for all Bachelor's degrees awarded by the University.

The second component is the major. This component provides for in-depth study of a field of specialization. The requirements for each major offered are found under the departmental listings.

The third component, elective courses, enables students to pursue personal interests, to explore new areas of learning, or to complete a minor or a second major.

The Core Curriculum: The First Curricular Component

The Core/General Education Requirements are an affirmation of the strong belief of the Wilkes Faculty in the value of study in the arts and sciences for all students. The Core is intended to serve as a foundation on which all degree programs are based and includes a broad spectrum of courses designed to stimulate the student's intellectual, personal, social, and physical development.

The Core Requirements for all programs follow. Students are urged to use this outline of the Core Requirements as an explanation of the **Recommended Course Sequence** provided for each major in this Bulletin. With the exception of Core Studies I, English 101-102, and Physical Education, which are specifically designated, the designation "Core Requirements" in the **Recommended Course Sequence** for each major is a reference back to this statement of the Core.

It is the student's responsibility to insure that **all** degree requirements, including the Core Requirements, are satisfied.

Core Curriculum

Skill Requirements

I. **Written Expression**

1. English Composition . . . . . .0-6 credits
   Students are assigned to an appropriate composition course, based on the results of a writing sample completed at the time of the student's initial registration. Advanced Placement test grades are taken into account in placement decisions.
2. Writing Intensive Courses
   Each student must complete three courses which appear on the "Writing Intensive List," which is available in the Registrar's Office and the

Department of English. Writing Intensive courses are offered in nearly all fields. Satisfaction of this requirement will not add credits to most students' programs.

II. **Oral Expression**

1. Completion of COM 101, 144A, 201, 203, 204, 205, 206, or 207.

OR

2. Completion of two Oral Presentation Option (OPO) experiences. The Registrar's Office maintains a list of OPO courses. OPO courses enable a specified number of students (or all students) in the course in a semester to complete an approved Oral Presentation experience. Students make arrangements with the instructor of an OPO course to deliver the number of in-class oral presentations required for completion of the oral presentation requirement of that course. The instructor notifies the Registrar of the names of students in his or her OPO course who have successfully completed the course on an OPO basis.

III. **Computer Literacy**

1. Completion of any credit course in computer science.

OR

2. A grade of 3, 4, or 5 on the Advanced Placement test in computer science or a CLEP test grade in the 50th or higher percentile.

OR

3. Exemption of the requirement through a demonstration of competence in computing by means of assessments administered by the Department of Mathematics and Computer Science.

IV. **Mathematics**

1. A score of 475 or higher on the mathematics section of the Scholastic Aptitude Test (or the equivalent).

OR

2. A passing score on the mathematics placement test administered at the time of the student's initial registration.

OR

3. Completion of a credit bearing course in mathematics.

V. **Foreign Language**

1. Demonstration, by means of a foreign language placement test administered at the time of the student's initial registration, of a level of language skill equivalent to the level expected of students who have completed 102 (or equivalent) college foreign language course. Tests are administered by the Department of Foreign Languages and Literature and are available in French, Spanish, and German, and by special arrangement in a variety of other languages.

OR

2. Completion of a foreign language course at the 102 or higher level.

Note: Students who graduated from secondary schools at which the primary language of instruction was **not** English satisfy the foreign language requirement by submission of a TOEFL score adequate for admission to Wilkes.

VI. **Collegiate Academic Life** . . . . . .0-1 credit

All entering students are required to complete CST 101, Core Studies I, which provides an introduction to the academic skills required for success in college. This course must be completed during the student's initial semester. Students who do not successfully complete Core Studies I during the initial semester of registration are automatically registered for CST 101 for the succeeding semester(s) of their enrollment.

Students who transfer 15 or more college credits to Wilkes at the time of their initial registration may elect to exempt Core Studies I with credit awarded.

VII. **Physical Fitness**

All students who are physically able are required to participate in a physical education experience for two semesters. No academic credit is awarded.

Distribution Requirements . . . . . .30/39 credits

All students must complete at least 30 credits of work in the distribution areas listed below. Students majoring in disciplines (Engineering and Music majors) which include 75 or more credits beyond the courses included in or used to satisfy core requirements may choose the lower number of credits in each **distribution area**; all other students must complete the higher number of credits in each **area**. All students are eligible, depending on placement in some cases, to select within the credit ranges indicated for the various sub-areas which are components of a distribution area. All students must complete the minimum number of credits shown for each sub-area.

Each student's selection of distribution courses must include at least one CST (Core Studies) course in an area other than the area which includes the student's major field. No more than two CST courses may be used to fulfill distribution requirements.

Area I: Culture and Value . . . . . .12/15 credits

[Courses selected must include at least one course which deals with a society other than the United States.]

– Culture . . . . . .3-6 credits
Course options: HST 101, 102, 207, 208

– Literature . . . . . .3-6 credits
Course options: ENG 151, 152, 253, 254, 381, 382

– Thought. . . . . .3-6 credits
Course options: PHL 101, 152, 210, 216, 220, and 230

– Foreign Language and Culture . . . . . .0-3 credits
Course options: ANT 352, 353
EC 227, 228
FR, GR, RUS, SP 203, 204, 205, 208, 298
HST 348, 361, 362, 363, 367

– Core Studies in Culture and Value . . . . . .0-6 credits
Course options: CST 201, 298

Area II: The Scientific World . . . . . .9/12 credits

– Mathematics/Computer Science . . . . . .0-3 credits
Course options: MTH 101, 102, 105, 106, 111, 112, 150
CS 115, 123

— Science . . . . . .6-12 credits
[Selections must include two different fields and one course with a laboratory component.]
Course options: BIO 105, 106, 107, 113, 115, 116, 121, 122
CHM 101, 102, 111, 115, 116, 130
EES 110, 115, 120, 125, 130, 211, 230, 240, 251, 280
PHY 101, 102, 105, 106, 201, 202, 203

— Core Studies in Science and Technology . . . . . .0-3 credits
Course option: CST 202

Area III: Society and Human Behavior . . . . . .6/9 credits

— Social Sciences . . . . . .3-9 credits
[No more than three credits in any one field.]
Course options: ANT 101, 270
EC 101, 102
PS 102, 105, 202
PSY 101
SOC 101, 200, 230, 235, 391, 392

— Core Studies in Society and Human Behavior . . . . . .0-3 credits
Course option: CST 203

Area IV: Artistic Expression. . . . . .3 credits

— Creative and Performing Arts . . . . . .0-3 credits
Course options: ART 101, 103, 104, 105, 115, 116
MUS 101, 102, (or any 3 credits in music performance
THE 140

— Core Studies in Artistic Expression . . . . . .0-3 credits
Course option: CST 204

Honors in Core Curricular Studies

The Honors Program in Core Curricular Studies is designed for exceptionally talented and strongly motivated students. Successful applicants (for qualifications and application procedures, contact the Admissions Office) who are designated University Scholars, participate in enriched academic and extra-curricular programs which foster creativity, independence, and responsibility.

University Scholars have the option of enrolling in an honors section of the freshman experience course, Core Studies 101. To earn a core honors designation upon graduation, University Scholars need to complete four core courses on an honors basis. They can fulfill this requirement by enrolling in either core courses designated honors options sections or in special honors seminar sections of the core. University Scholars supplement their enriched academic experience by participating in the meetings and cultural excursions of the University Honors Society.

Selection of a Major: The Second Curricular Component

Each student must complete a major in a discipline or area of concentration in order to graduate. Specific requirements for each major are described in detail in the departmental listing in this Bulletin. The major must be declared prior to the first semester of the student's junior year.

Bachelor of Arts Degree — Majors

Majors in the Bachelor of Arts degree program may be selected from the following subject areas:

Applied and Engineering Sciences
Art
Biochemistry
Biology
Chemistry
Communications
Computer Science
Earth and Environmental Sciences
Economics
English
French
German
History
Individualized Studies
International Studies
Mathematics
Philosophy
Physics
Political Science
Psychology
Sociology
Spanish
Theater Arts

Bachelor of Science Degree — Majors

Majors in the Bachelor of Science degree program may be selected from the following subject areas:

Accounting
Biochemistry
Biology
Business Administration
Chemistry
Computer Information Systems
Computer Science
Earth and Environmental Sciences
Electrical Engineering
Engineering Management
Environmental Engineering
Individualized Studies
Materials Engineering
Mathematics
Mechanical Engineering
Medical Technology
Nursing
Physics

Bachelor of Fine Arts Degree — Art Major

Bachelor of Music Degree — Music Major

Teacher Education

Students who wish to prepare for a teaching career select an appropriate disciplinary major and use their elective credits to meet teacher-certification requirements. A list of the courses needed for certification is provided in the departmental description of the Education Department in this Bulletin. Students planning a teaching career must seek counseling in the Education Department early in their first semester.

Elective Credits: The Third Curricular Component

The third component of the Wilkes Curriculum, after the Core Requirements and the Major Requirements, is composed of elective courses. Students choose elective courses for a variety of reasons: to pursue an interest or to meet requirements for admission to graduate or professional schools or to hone particular skills.

Selection of a Minor

One of the common reasons students select elective courses is to complete a minor in a field other than the student's major field. Although not required for graduation, minors are formally recognized on the student's transcript and may enhance a student's credentials. Students should consult the departmental listing in this Bulletin to review the specific requirements for formal recognition of a minor field in particular disciplines. They must complete the appropriate form in the Registrar's Office, should they decide to complete a minor. Students must complete a minimum of one-half of their minor field credits in Wilkes University courses for the minor to be formally recognized on the Wilkes transcript.

Cooperative Education

Program

Cooperative Education, another possible use of elective credits, is a program that formally integrates a student's studies with work experiences in employing organizations. Students may alternate semesters of full-time study and full-time professional work experience or they may combine work and study in the same term; in either case, students earn academic credit and, in many cases, a salary while gaining valuable experience in a work environment. Internships are available throughout the United States in the summer, spring and/or fall, and internship placements are readily available to eligible students. Students are urged to explore the various possibilities with the Coordinator of Cooperative Education as soon as possible after their arrival on campus.

Procedure

1. Student visits Cooperative Education Office to discuss career goals and placement options during pre-registration for the semester/session in which the co-op is desired.
2. Student obtains approval signature of academic advisor on Cooperative Education Form.
3. Resumes are sent to co-op employers and interviews are arranged.
4. Upon mutual agreement of student and employer, student obtains a placement. The signatures of the Cooperative Education Coordinator, Faculty Advisor and Chairperson of the Department performing academic evaluation of the student must be obtained on the Cooperative Education Placement Confirmation Form. A job description must be furnished to the Department Chairperson at this time. The Department Chairperson will approve appropriate placement for academic credit and indicate the number of credits and departmental elective(s) and/or cooperative education elective(s) for which the student may register.
5. The Department Chairperson assigns a faculty coordinator to counsel, evaluate, and grade the student's performance during the placement.

6. The student takes the Placement Confirmation Form to the Registrar's Office and officially registers for academic credit for the cooperative education experience.
7. Student attends Pre-employment Seminar and begins the placement under the guidance and supervision of a Faculty Coordinator.

Study Abroad

Program

The Study Abroad Program, a part of the International Studies major and an elective option to students from many other majors, enables students in good academic standing to earn academic credits at overseas institutions which can be applied toward the requirements for a bachelor's degree at Wilkes. Overseas study may be for a period of a year, a semester, or a summer. A wide variety of curricular offerings, international internships, cultural settings, and living situations are available in over 30 countries throughout the world. Students interested in this option should contact the Study Abroad Advisor in the Department of Foreign Languages.

Procedure

1. In consultation with the Study Abroad Coordinator and the Academic Advisor, the student selects an approved and accredited study abroad program and makes a preliminary selection of courses. The student obtains a Transfer of Credit Form for submission in step 4 below.
2. The student applies for acceptance to the approved study abroad program.
3. Student obtains the necessary signatures for completion of the Transfer of Credit Form and submits it to the Registrar's Office.
4. If a student wishes to use financial aid to help meet the educational cost associated with study abroad, the student must complete a Wilkes Consortium Agreement in addition to the regular financial aid applications. Only Pell Grants, State Grants, Stafford Loans and/or PLUS/SLS Loans are available to students during the study abroad semester. It is recommended that students wishing to use financial aid meet with the Director of Financial Aid to review the proper procedure for obtaining funds.
5. Costs such as tuition, room, board, or travel are paid by the student to the study abroad institution.
6. The student registers for I.S. 398 at Wilkes for the period at the study abroad institution, incurring an administrative fee.
7. The student ensures that an official transcript of his or her earned academic credit at the study abroad institution is sent to the Wilkes University Registrar's Office.
8. Within one month of completing the study abroad courses or upon return to campus, it is the student's responsibility to meet with the Study Abroad Coordinator to confirm receipt and recording by the Registrar's Office of authorized and completed study abroad credit.

Double Major

Students may choose to use their elective credits to complete a second major. The student must declare intent to graduate with a double major by completing the appropriate form at the Registrar's Office. It is the student's responsibility to secure the approval of the chairperson of both departments to ensure that all requirements of the two majors are fulfilled.

Second Baccalaureate Degree

Students who hold a bachelor's degree with a major in one discipline from this or another accredited institution may be awarded a second baccalaureate degree in another discipline. Candidates for this second degree must earn at least thirty credits at Wilkes beyond those required for the first degree.

A candidate for a second degree must complete all requirements for the degree at Wilkes. For this purpose credits may be transferred from the institution which granted the first degree. However, approval of transfer credit for any course required by the proposed major and of the overall program to be followed must be obtained from the Dean of Admissions and, also, from the chairperson of the proposed major department.

Adult, Graduate and Continuing Education

Part-time Studies

The University welcomes part-time undergraduate students into all of its regular sessions. It has also established the Evening and Weekend Programs to maximize scheduling possibilities for students who cannot attend day classes. Majors in several disciplines are offered in the evening and on weekends, and students may utilize both options, in addition to day-classes, as their commitments and interests change. Many students complete their degree requirements in one or the other of these special formats.

Non-degree students may be admitted to classes which they are qualified to take by reason of their maturity, previous education, and work experience. Secondary school training is desirable, but not necessary, provided the student is qualified to follow such special courses of instruction. Inquiries about all of these programs should be directed to the Office of Evening, Weekend, and Summer Programs.

Evening Program

The Evening Program is designed to meet the needs of those students who cannot attend daytime classes but wish to pursue a degree. Courses meet one or two nights per week during the academic year and three nights per week during the eight-week evening summer session. Majors in the following fields are provided in the evening: Accounting, Business Administration, Computer Information Systems, Earth and Environmental Sciences, Electrical Engineering, Engineering Management, Environmental Engineering,

History, Materials Engineering, and Physics. Students interested in evening courses should contact the Evening, Weekend, and Summer Office to plan their courses of study.

Weekend Program

Wilkes's Weekend Program provides upper-division courses on the campus of Keystone Junior College in La Plume, Pennsylvania, enabling graduates of Keystone Junior College and other accredited two-year institutions to complete bachelor's degrees in certain majors by taking courses only on weekends. Majors available in the Weekend Program include Accounting, Business Administration, Economics, Psychology, and Sociology. Students beginning as freshmen in the Weekend Program apply for admission to Keystone Junior College.

The courses meet every third weekend on the Keystone College campus, which is ten miles west of Scranton on Route 6/11. Residence hall facilities are available on a first-come, first-served basis to students in both the Keystone and Wilkes programs. Students may carry as many as 9 credits in each of three different sessions arranged over the calendar year. Inquiries about the Weekend College should be directed to the Office of Evening, Weekend, and Summer Programs.

Summer Programs

Wilkes offers a variety of summer courses, workshops, mini-courses, and programs with outdoor activities during the summer months. The summer schedule includes two five-week daytime sessions and an eight-week evening session. Students interested in the Summer Programs should contact the Evening, Weekend, and Summer Programs Office for specific information.

Graduate Studies

Programs leading to the master's degree are available in the fields of Business Administration (MBA), Education (M.S. Ed, with a variety of concentrations), Electrical Engineering (MSEE), Health Care Administration (MHA), Mathematics, Nursing and Physics (MS).

A separate Graduate Bulletin, which describes graduate programs in detail, is available upon request from the Office of Graduate Studies.

Continuing Education

In addition to courses for credit, Wilkes provides a non-degree Continuing Education program to respond to the needs and interests of the community. This program includes training for business, industry, government, associations, social service agencies, and individuals, through the use of public seminars, in-house presentations and conferences. Inquiries about offerings of the Continuing Education Office should be addressed to the Division of Graduate Studies and Adult Education.

Academic Policies and Procedures

Registration

Incoming freshman and transfer students register during the orientation sessions that precede each semester. All students are expected to preregister with their advisors and to register on the dates specified on the University Calendar. Additional information on registration procedures and the exact dates of the orientation sessions can be obtained from the Office of Admissions or the Registrar's Office.

Attendance

Attendance at all classes is expected and required. Repeated absences are a sufficient cause for failure.

Student Load

Students may register for as many as 18 credits in a semester. No student shall be allowed to carry more than 18 credits without the written approval of his or her advisor. An overload will be permitted only for students with a grade point average of 3.00 or higher.

Wilkes/King's Cross-Registration

Wilkes University and King's College offer their students an opportunity to cross-register for courses at either institution. Students register through the Registrar at the institution at which they are enrolled as degree candidates. Interested students should confer with the Registrar for further details.

Auditing Courses

Auditing courses is a practice designed primarily to allow students to expand their educational opportunities. Courses may be taken on an Audit basis only if formal registration is completed prior to the end of the first week of the semester. Permission of the course instructor will be required. Students withdrawing from a course who wish to attend additional classes in that course may do so with the permission of the instructor. However, these students will receive a grade of "W" (withdrawal) in all cases.

Students auditing courses will maintain all standards, including attendance, required by the instructor. Students who do not maintain these standards will not be awarded Audit recognition. All relevant fees will be charged.

Change of Major

Students who wish to change their majors must obtain the approval of the advisor and the department chairperson. The student shall satisfy the curriculum requirements of the Bulletin in force at the time of transfer. Change-of-major forms are available in the Registrar's Office.

Transfer of Credits

Wilkes students who wish to take courses at another accredited institution (except King's College) must have completed the Transfer of Credit form, available at the Registrar's Office. The student must earn a grade of 2.00 or higher for the work to be credited toward graduation. All students must complete at least 30 credits in residence at Wilkes.

Grades earned for transfer credits are not included in the calculation of grade point averages.

Withdrawals

Students may withdraw from a course through the sixth week of instruction by notifying their instructor and academic advisors. This process must be completed and all necessary paperwork placed in the hands of the Registrar prior to the completion of the sixth week of instruction. After the sixth week, students may withdraw only with the written approval of the course instructor and faculty advisor. The School of Science and Engineering requires its majors to petition the respective department to withdraw from any School-offered course. The department's decision is final. Students who do not fulfill these requirements and do not satisfactorily complete the course will receive a grade of "0".

A student who has been advised to withdraw from the University for academic reasons will not be permitted to register in the evening, summer or weekend college.

The Family Educational Rights and Privacy Act of 1974

In accordance with the provisions of "The Family Educational Rights and Privacy Act of 1974," students, upon request, will be given access to all of their evaluative records which have been established by Wilkes University, with at least one day's advance notice to the office responsible for the records to which the student seeks access.

Academic Requirements

Grades

The primary purpose of any grading system is to inform the student of his or her academic progress. Grade reports are sent to students at the end of each term. Mid-term reports are sent **if the work completed is unsatisfactory.**

Eight numerical grades are given for academic work:

Grade	Interpretation
4.00	Academic achievement of outstanding quality.
3.50	Academic achievement above high quality.
3.00	Academic achievement of high quality.
2.50	Academic achievement above acceptable quality in meeting requirements for graduation.
2.00	Academic achievement of acceptable quality in meeting requirements for graduation.
1.50	Academic achievement above the minimum quality required for credit.
1.00	Academic achievement of minimum quality required for credit.
0.00	Academic achievement below the minimum required for course credit.
P	Passing, no credit.
W	Withdrawal.
N	Audit, no credit.

"X," "Inc.," means that the student received an incomplete grade. Incompletes will be granted to students who, because of illness or reasons beyond their control, have been unable to satisfy all course requirements including the final examination. When such a grade is given, the incomplete work must be made up by or before the end of the fourth week following the last day of the examination period or the grade becomes zero, unless a special extension has been approved by the Registrar.

Course Credits and Grade Point Average

Each course at the University is assigned a specific number of credits. For example, English 101 is a 3-credit course and Chemistry 115 is a 4-credit course. Usually, credits assigned to the course are determined by the number of hours that the class meets per week.

Below is an example illustrating the method used to compute grade point averages.

Course	Credit Hrs. Attempted		Grade		Quality Points	Credit Hrs. Passed
Bio 103	3	×	4.00	=	12	3
Eng 101	3	×	0.00	=	0	0
Fr 101	3	×	2.50	=	7.5	3
Hst 101	3	×	1.50	=	4.5	3
Mus 101	3	×	3.00	=	9	3
Total credit hours attempted	15					
Total credit hours passed						12
Total quality points earned					33	
Average 33 q.p. ÷ 15 hrs. attempted = 2.20						

Notice that the student has accumulated 12 credits toward graduation. The zero grade in English means that the student must repeat that course.

Averages are cumulative; the work of each semester will be added to the total. To graduate a student must have, at the end of the senior year, at least a 2.00 average for all courses and a 2.00 average in the major field.

Transfer credits are not included in the calculation of grade averages.

Academic Honors

The faculty grants recognition for high quality work. To be on the Deans' List, published at the end of each term, a student must earn a semester grade point average of 3.40 or higher for all courses taken. Students taking fewer than twelve credit hours will not be eligible.

Academic Probation and Ineligibility

Freshmen, defined as students who have completed fewer than thirty-six credits, must maintain a 1.70 cumulative grade point average. All other students must maintain a minimum 2.00 in both their major and cumulative grade point averages. A student who falls below the minimum average required will *automatically* be placed on academic probation. Probation is a warning to the student that he or she is not making satisfactory progress towards a degree. At the end of the first semester, a student whose grade point average is less than 0.5 may be declared academically ineligible to continue.

Students placed on academic probation may be restricted in the number of credits they take the following semester, based on the recommendation of the student's academic advisor and such action by the Academic Standards Committee. The Committee may impose additional restrictions and requirements in individual cases, if it is determined that such restrictions and requirements are in the best interest of the student. Such restrictions may affect the student's participation in extracurricular activities.

Students who remain on academic probation for two consecutive semesters are subject to designation as academically ineligible to continue at Wilkes.

Students who have been declared academically ineligible are not allowed to enroll in any course work at Wilkes for a period of one semester. To be considered for readmission such students need to apply to the Student Affairs and Registrar's Offices and be approved for readmission on a probationary status by the Chairperson of the Department in which the student has a declared major. If the student has not declared a major, readmission must be recommended by the Dean of Student Affairs. Students applying for readmission must present evidence of enhanced prospects for academic success. All readmissions must be reported to the Academic Standards Committee for final approval.

A decision of the Academic Standards Committee may be appealed by the student at the designated meeting for appeals at the conclusion of the fall and spring semesters. Appeals must be presented to the Committee either in person or by letter at the appropriate appeals meeting, and should include good and sufficient reasons for appealing.

Academic Honesty

Academic honesty requires students to refrain from cheating and to provide clear citations for assertions of fact as well as for the language, ideas and interpretations of others that have contributed to their written work. Failure to acknowledge indebtedness to the work of others constitutes plagiarism, a serious academic offense that cannot be tolerated in a community of scholars. All instances of academic fraud will be addressed in accordance with the policies of the University.

Graduation Requirements

It is the student's responsibility to meet graduation requirements. All candidates for degrees are expected to be present at Commencement. If circumstances prevent their attendance, students must apply to the Dean of Student Affairs for permission to take the degree or certificate *in absentia.*

The faculty has approved the following requirements which a student must satisfy in order to be eligible for graduation:

1. Complete a *minimum* of 121 credit hours.
2. Satisfy all requirements in the major(s). (Requirements for graduation vary from department to department. See the appropriate section in this Bulletin for the number of credit hours required by each major.)
3. Complete all subjects required for the degree as stated in the Bulletin in force at the time of admission to the program or any subsequent Bulletin.
4. Achieve a minimum cumulative average of 2.00 for all courses.
5. Achieve a minimum cumulative average of 2.00 for all subjects within their major.
6. Achieve a minimum cumulative average of 2.00 for all subjects within the chosen minor(s).
7. Satisfy all requirements pertaining to the physical education program.
8. Demonstrate competence in written and spoken English.
9. Demonstrate competence in mathematics and computer literacy.

No student shall be graduated until all financial obligations to the University have been fulfilled.

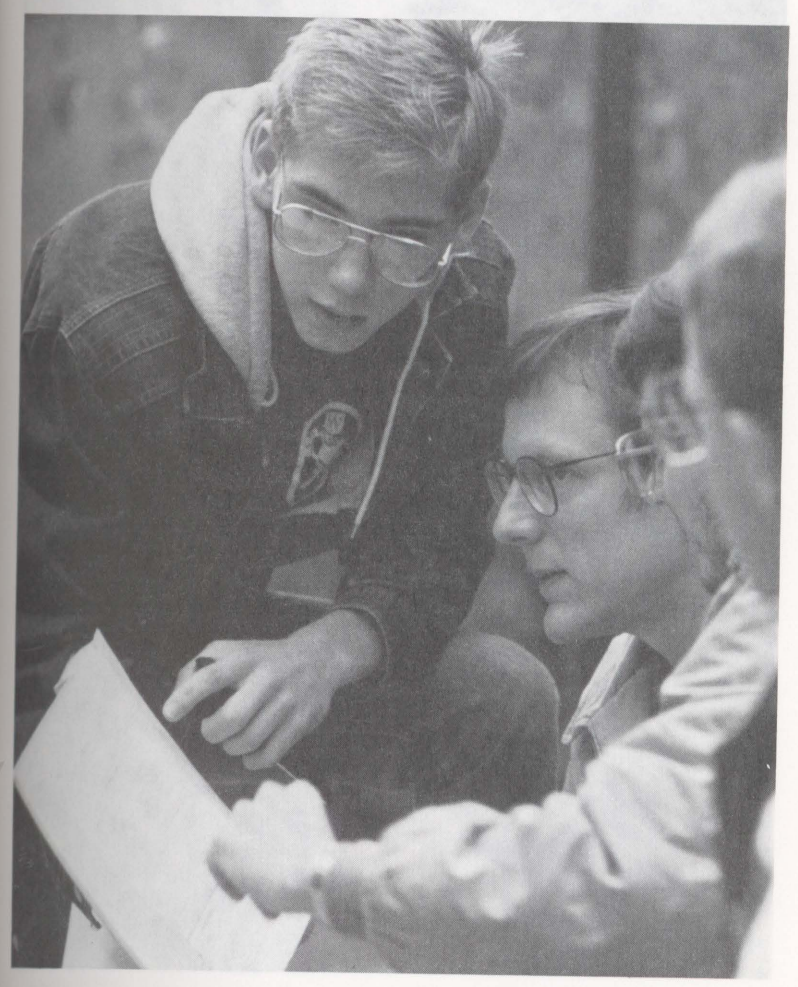
Degree Honors

The granting of honors at Commencement is based upon the entire academic record achieved by the student.

Transfer students must have completed a minimum of 60 credits at Wilkes, with the cumulative average equal to the honors received to be considered for honors. The entire academic record, including grades earned at Wilkes and any other institution attended, affects the final cumulative average for honors.

Requirements for Degree Honors are:

Summa Cum Laude	3.80
Magna Cum Laude	3.60
Cum Laude	3.40



Academic Structure

The School of Business, Society and Public Policy

Departments
Accounting
Business Administration and Economics
Health Care Administration
Political Science and Public Administration
Sociology and Anthropology

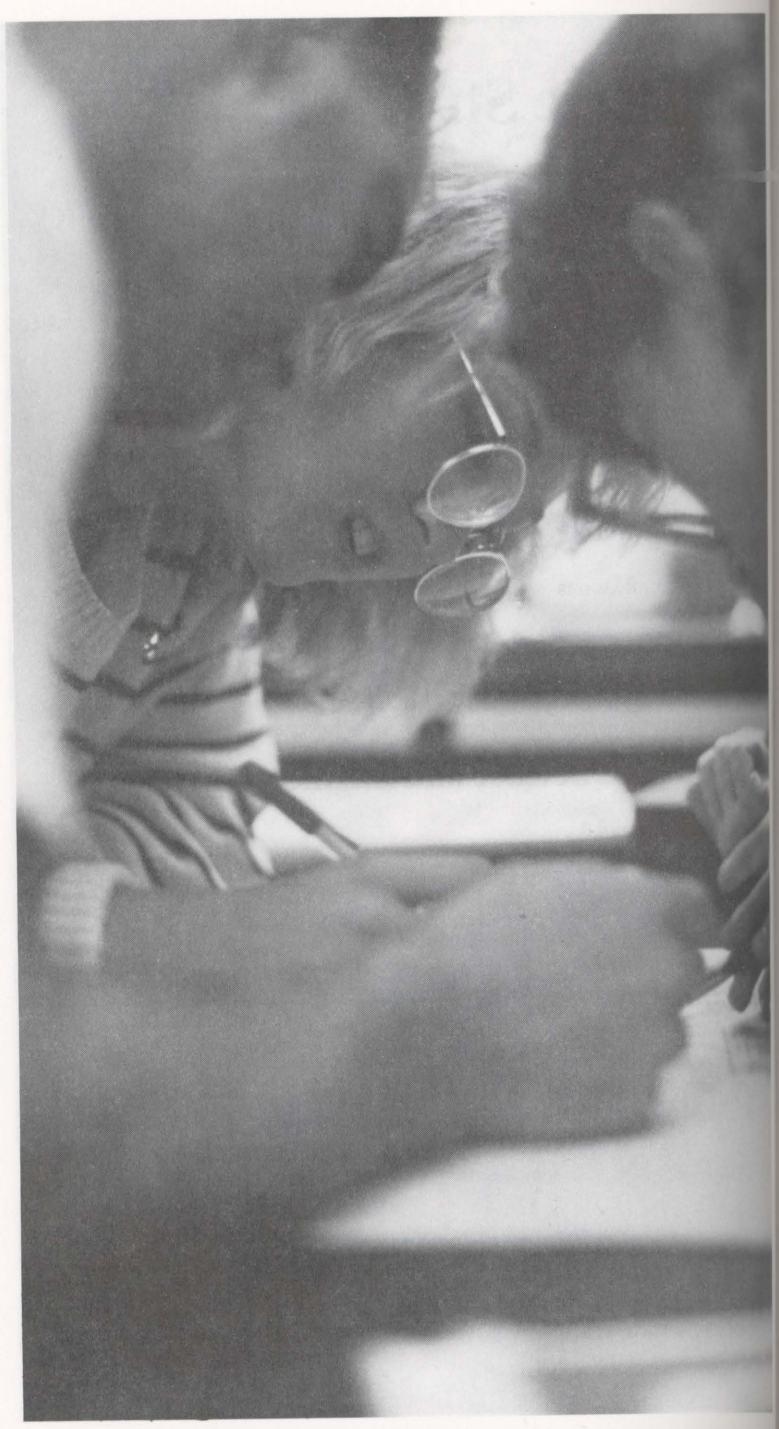
The School of Liberal Arts and Human Sciences

Departments
Art
Communications
Education
English
History
Foreign Languages
Music, Theater and Dance
Nursing
Philosophy
Physical Education
Psychology

The School of Science and Engineering

Departments
Aerospace Studies
Biology
Chemistry
Earth and Environmental Sciences
Engineering
Mathematics and Computer Science
Physics

University-wide Core Studies Courses



The School of Business, Society, and Public Policy

Theodore J. Engel, M.A.
Dean of the School

The School of Business, Society, and Public Policy offers a number of programs leading to a Bachelor of Science degree in Accounting or Business Administration, and a Bachelor of Arts degree in Economics, Political Science, or Sociology. Minors in all areas also are available.

The unifying concept linking all the various academic programs in the School is the intellectual commitment to the study and analysis of human interaction within the framework or context of a business organization, society, political body, family, or other collective entity. These programs prepare students for professional and leadership positions in business, industry, higher education, social service agencies, government, and nonprofit organizations of many types, as well as professional licensings, graduate education, and professional schools. Interdisciplinary ventures, such as the Computer Information Systems and Engineering Management programs, provide opportunities for students to create individualized educational experiences. The Pre-Law and International Studies programs also are components of the School. At the graduate level, the School offers the Master of Business Administration and Master of Health Administration degrees.

The School includes the following departments:

Accounting
Business and Economics
Health Care Administration
Political Science/Public Administration
Sociology/Anthropology

ACCOUNTING

Associate Professor Chisarick, Chairperson; Professor Capin; Associate Professor Broadt.

Total minimum number of credits required for a major in Accounting leading to the B.S. degree — 126.
Total minimum number of credits required for a minor — 24.

The School of Business, Society, and Public Policy offers a major in Accounting providing the necessary background for an entry-level professional position in public, private or governmental accounting. Students receive the necessary educational background to compete successfully for placement in graduate and professional schools, and licensures as certified public accountants and/or chartered management accountants. Those choosing a career in administration receive the managerial training necessary for success in a full range of leadership roles.

The accounting curriculum parallels that of business administration and consists of three tiers or levels. It begins with a comprehensive study of the arts, sciences, mathematics, communications, and humanities. This liberal arts core, which is a common experience to all majors, provides the basis for a broadly educated individual. The second level of educational experience provides a general background in statistical, financial, and managerial techniques. Subjects included in this area of study are finance, economics, management, and computer science. The final level of basic educational skills relates to the field of financial and managerial accounting. A rigorous thirty credit hours are devoted to current accounting theory and applications through the use of texts, cases, and practical experience. This sequence begins with introductory level accounting and progresses through intermediate, tax, cost, auditing, and system components. A fourth level also is available. Students with the classroom background described may participate in a practical experience through an accounting internship. Most students are placed with public accounting firms where it is possible to experience a broad range of business problems in a short time-span. However, for students with a more specialized interest, accounting internships are also available in banking, industry, and with the government. The internship program has been available at Wilkes for the past thirty years, and most qualifying applicants have been placed in positions of their choice, including the large international accounting firms.

The accounting curriculum is a demanding and comprehensive educational experience. It does not allow much flexibility in the selection of elective courses outside the basic core. However, both communication and computer skills are now an integral part of each accounting course offering. The individual completing this program is educationally qualified to meet every state's legal requirements for the certified public accountant examination.

Students from other disciplines, even those unrelated to business or economics, have been inclined to select an accounting minor, along with their major field of study. The minor provides the student with enough background to begin with professional entry-level employment while developing a background in his chosen field of study. The minor program is composed of Acc 121-122, Acc 211-212, and twelve additional credits in accounting.

Accounting alumni can be found in firms ranging in size from those of individual practitioners to international organizations. Many of our graduates who began their careers with such firms have since moved into leadership positions with governments or private industry. The accounting major in the School of Business, Society, and Public Policy at Wilkes University will provide an individual with the combined educational skills to be a future success as a leader in the accounting profession, industry, or government.

Recommended Course Sequence for a Major in Accounting

First Semester	
Eng 101 Composition I	3
Core Requirements	9
Mth 101*	3
CST 101 Core Studies I	1
PE 100 Activity	0
	16

Second Semester	
Eng 102 Composition II	3
CS 115 Survey of Computers	3
Core Requirements	6
Mth 102*	3
PE 100 Activity	0
	15

Third Semester	
Acc 121 Financial	3
Ec 101 Economics I (Core Course)	3
SCT 101 Public Speaking or SCT 206	3
Core Requirements	9
	18

Fourth Semester	
Acc 122 Managerial	3
Ec 102 Economics II	3
Core Requirements	6
Free Elective	3
	15

Fifth Semester	
Acc 211 Intermediate Acc I	3
Acc 221 Taxes	3
Ec 231 Statistics I	3
BA 209 Business Correspondence	3
BA 225 Finance	3
BA 233 Legal Environment	3
	18

Sixth Semester	
Acc 212 Intermediate Acc II	3
Acc 224 Advanced Taxes**	3
Ec 232 Statistics II	3
BA 226 Investments	3
BA 234 Law and Ethics	3
Free Elective	3
	18

Seventh Semester	
Acc 231 Auditing	3
Acc 233 Cost Accounting	3
Acc 251 Senior Seminar** (prerequisite for Acc 252)	3
Ec 201 Money and Banking	3
BA 351 Management	3
	15

Eighth Semester	
Acc 234 Accounting Systems**	3
Acc 244 Advanced Accounting	3
Acc 252 Internship**	3
Free Elective	3
	12

*Mth 101 and 102 or a higher sequence required of all accounting majors.
**Accounting electives.

ACC 121. INTRODUCTORY FINANCIAL ACCOUNTING **Three credits**
Introduction and development of the overall accounting function from analysis of business transactions and their systematic recording to the interpretation of the resulting financial statements. Fee: $20.
Prerequisite: Sophomore standing or permission of instructor.

ACC 122. INTRODUCTORY MANAGERIAL ACCOUNTING **Three credits**
Introduction to the accounting requirements necessary in a management environment and the uses of accounting data for planning and control of business and non-profit activities. Fee: $20.
Prerequisite: Acc 121.

ACC 211. INTERMEDIATE ACCOUNTING I **Three credits**
A comprehensive analysis of the accounting process and the financial statements. Intermediate problems pertaining to cash, receivables, inventories, current liabilities, and investments in stocks.
Prerequisite: Acc 122.

ACC 212. INTERMEDIATE ACCOUNTING II **Three credits**
A continuation of Intermediate Accounting I. Intermediate problems pertaining to investments in bonds and funds, plant and equipment, intangibles, long-term liabilities, and stockholders equity; financial statement analysis and fund and cash flow reporting.
Prerequisite: Acc 122.

ACC 221. TAXES **Three credits**
The preparation of federal income tax returns for individuals and businesses based on the current law, regulations, and current decisions; research of tax law, regulations, and current decisions; research of tax law using various tax reference services and computer data-base access.
Prerequisite: Acc 122.

ACC 224. ADVANCED TAXES **Three credits**
Tax accounting for corporations, partnerships, and fiduciaries, including corporate organization, reorganization, distributions and liquidation. Preparation of federal corporate, partnership, and fiduciary returns.
Prerequisite: Acc 221.

ACC 231. AUDITING **Three credits**
An analysis of modern auditing concepts involving staff organization, professional ethics and legal responsibility, internal control, audit programs and working papers, and original record examination.
Prerequisite: Acc 212.

ACC 233. COST ACCOUNTING **Three credits**
Principles and practices of cost accounting including a study of job, process, and standard cost systems. Informative systems design, budgeting, variance analysis, and direct costing concepts are covered.
Prerequisite: Acc 212.

ACC 234. FINANCIAL AND MANAGERIAL ACCOUNTING SYSTEMS **Three credits**
Review of the systems used to accumulate and report accounting information with emphasis on computer applications.
Prerequisite: Acc 212.

ACC 244. ADVANCED FINANCIAL ACCOUNTING **Three credits**
A comprehensive review and analysis of various accounting problems relating to corporate consolidations, partnerships, governmental units, non-profit organizations, estates, trusts, and bankruptcies.
Prerequisite: Acc 212.

ACC 251. SENIOR SEMINAR IN FINANCIAL ACCOUNTING **Three credits**
Current topics in financial accounting and corporate reporting are reviewed. Case studies requiring generally accepted accounting principle applications will be an integral part of the topics covered.
Prerequisite: Acc 212.

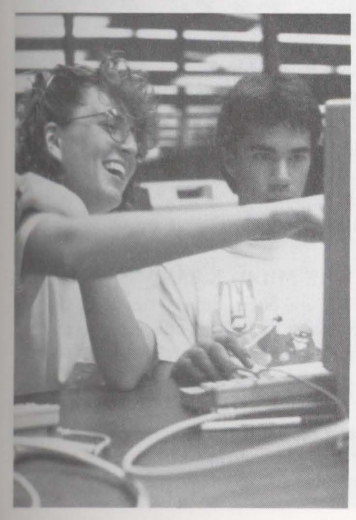
ACC 252. ACCOUNTING INTERNSHIP **Three credits**
This course provides on-the-job accounting experience for accounting majors. A minimum of 240 hours is provided with either certified accounting firms, government agencies, or private industry. Internships are offered on a competitive basis following student interviews with interested firms and agencies. Students not obtaining an internship must substitute a 200- or 300-level course in the School of Business and Economics. (All courses listed through the seventh semester should be taken prior to this course.)

ACC 395-396. INDEPENDENT RESEARCH **One to three credits**

ACC 397. SEMINAR **One to three credits**

ACC 399. COOPERATIVE EDUCATION **Three or six credits**
Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)
Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

ACC 198/298/398. TOPICS **Variable credit**
Special offerings designed to introduce students to subjects of current interest in accounting which are not covered in other courses.





ANTHROPOLOGY

Associate Professor Natzke, Chairperson; Associate Professor Merryman.

The Department of Sociology and Anthropology offers a variety of courses in anthropology. The anthropology curriculum is designed to provide students with a solid grounding in the fundamentals of sociocultural anthropology and an opportunity to study cultural diversity. Students may apply anthropology courses towards B.A. degrees with majors in either International Studies or Sociology (see pages 96 and 106). Anthropology courses may also be used in satisfying general college core requirements in the social sciences.

Graduates with a strong background in anthropology have used this preparation in a variety of ways. Some have found employment in business and government upon graduation. Others have taken advanced degrees in the social sciences and regional development at American and British Universities. Still others have pursued careers in secondary education.

The following is a listing of the Anthropology courses offered at Wilkes:

ANT 101. INTRODUCTION TO ANTHROPOLOGY **Three credits**
A general survey of the processes that generate human cultural and biological variation through time and among contemporary human groups. An introduction to cultural and physical anthropology, archaeology, and anthropological linguistics.

ANT 204. LANGUAGE AND CULTURE **Three credits**
The study of relationships among language, culture and perception, and patterns of language use. Recent ethnographic approaches to the understanding of culture and cognition.

ANT 250. ANTHROPOLOGY THROUGH FILM **Three credits**
A general survey of the use of still photography and cinematography in the depiction of the content of various cultures. Fee: $20.

ANT 270. CULTURAL ANTHROPOLOGY **Three credits**
A detailed examination of the methods and theories employed in the description and comparison of human cultures, as applied to problems in intercultural relations. Course content is based upon case and cross-cultural studies.
Prerequisite: Ant 101, or approval of instructor.

ANT 351. INDIANS OF NORTH AMERICA **Three credits**
The prehistoric development and recent life-ways of native Americans.

ANT 352. PEOPLES AND CULTURES OF THE MIDDLE EAST **Three credits**
An overview of social organization, ethnicity, and cultural development in the Middle East and North Africa. The contributions of ecological, economic, political, and ideological factors to Middle Eastern social systems are examined in regard to present cultural configurations.

ANT 353. PEOPLES AND CULTURES OF AFRICA **Three credits**
An overview of social development in Africa south of the Sahara. Particular attention is paid to Africa's historical relationship to other culture areas, indigenous social patterns, and issues surrounding the push for socioeconomic development in Africa's emergent nations.

ANT 392. SOCIOCULTURAL CHANGE **Three credits**
A systematic evaluation of various attempts by social scientists to document and explain the phenomenon of change. A comprehensive survey of the field is presented through selected readings and discussion of major studies from sociology, cultural anthropology, and archaeology.
Prerequisite: Soc 101 or Ant 101, or approval of instructor.

ANT 395-396. INDEPENDENT RESEARCH **One to three credits**
Independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.
Prerequisite: By arrangement with an instructor.

ANT 397. SEMINAR **Three credits**
Presentations and discussions of selected themes and issues in anthropology.
Prerequisite: Criteria will vary according to content of seminar.

ANT 398. TOPICS **Three credits**
A study of topics of special interest not extensively treated in regularly offered courses.

ANT 399. COOPERATIVE EDUCATION **Three or six credits**
Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)
Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.



BUSINESS ADMINISTRATION

Associate Professor Peper, Chairperson; Professors Emeritus Farrar, Gera; Professor Basu; Associate Professors Engel, Liuzzo, Oberstein, O'Hop, Schwartz, Seeley; Assistant Professors Batory, Penugonda, Raspen, Rodin.

Total minimum number of credits required for a major in Business Administration leading to the B.S. degree — 126.

Total minimum number of credits required for a minor — 24.

The Department of Business and Economics offers a major in Business Administration with a variety of tracks leading to executive careers in business, industry, and government. Students interested in pursuing graduate degrees, attending professional schools, or seeking professional licensings will find that the curriculum will prepare them for such challenges.

The business administration curriculum is composed of three tiers or steps intended to combine simultaneously a rigorous education with the flexibility of individualized program design. The first sequential tier is the liberal arts core. If business administration majors are to become effective leaders and self-fulfilled individuals, they must possess the skills and knowledge acquired through a demanding exposure to the arts, sciences, mathematics, and humanities. The next tier of the curriculum is the business administration core. This core transmits a common educational experience to all majors by addressing topics believed necessary for effective managers to possess. Subjects studied include such disciplines as finance, marketing, economics, management, and computer science. The third and final tier is represented by what is known as a "concentration". Each student must take at least six courses from a menu of offerings in at least one concentration. This is the stage at which students can select the concentration and courses that focus upon their own personal career goals and ambitions. Choices include such areas as international business, marketing, and finance.

The business administration curriculum also allows for a number of free electives for further customization of one's education. A student who wishes to declare a minor, perhaps in computer science or communications, readily can do so. Minors, double majors, or a personalized package of electives can be constructed around the interests of the student.

For majors in other disciplines, the Department of Business and Economics currently offers minors in finance, marketing, management, and quantitative business analysis. Thus, students who may be contemplating a career in business as a means of fully utilizing their major of choice will find that these minors will complement their other academic interests.

Business administration alumni are to be found in positions of leadership in organizations throughout the world. Our alumni staff the faculty of colleges and universities nationwide. For the next generation of executives and

professionals seeking such realization of ambitions, the Business Administration Program at Wilkes will prepare them admirably for their demanding future.

Recommended Course Sequence for a Major in Business Administration

First Semester		Second Semester	
Eng 101 Composition I	3	Eng 102 Composition II	3
Core Requirements	6	Core Requirements	6
CST 101 Core Studies I	1	Mth 102 Fundamentals*	3
Mth 101 Fundamentals*	3	SCT 101 Public Speaking or SCT 206	3
CS 115 Survey of Computers	3	PE 100 Activity	0
PE 100 Activity	0		15
	16		

Third Semester		Fourth Semester	
Acc 121 Accounting I	3	Acc 122 Accounting II	3
BA 233 Legal Environment	3	Ec 102 Economics II	3
Ec 101 Economics I (Core Course)	3	Core Requirements	9
Core Requirements	6		15
	15		

Fifth Semester		Sixth Semester	
BA 209 Business Correspondence	3	BA 222 Marketing	3
BA 351 Management	3	BA 352 Operations Management	3
Ec 201 Money and Banking	3	or BA 354 Organizational Design	
Ec 231 Statistics I	3	Ec 232 Statistics II	3
Core Requirement	3	Core Requirement	3
Free Elective	3	Free Elective	3
	18		15

Seventh Semester		Eighth Semester	
BA 225 Finance	3	Concentration Electives	12
Concentration Electives	9	Free Elective	3
Free Electives	6		15
	18		

*Or a higher sequence.

B.A. CONCENTRATIONS

Students who major in business administration must take at least six courses from one of the following concentrations:

BANKING AND FINANCE

Acc 221 Taxes
BA 220 Real Estate
BA 226 Investments
BA 240 Property Insurance
BA 241 Life Insurance
BA 395-396 Independent Research
BA 398 Topics
CS 115 Survey of Computers and Data Processing **or**
CS 124 COBOL Programming*
Ec 224 Economic Development
Ec 225 International Trade
Ec 226 International Investment and Finance
Ec 236 Public Finance
Ec 241 Microeconomics I
Ec 251 Macroeconomics I
Ec 252 Macroeconomics II
Mth 105 Introductory Calculus I
Mth 106 Introductory Calculus II
PS 316 Government Budgeting
COM 206 Business and Professional Speaking

ECONOMICS

BA 212 Government and Business
CS 115 Survey of Computers and Data Processing **or**
CS 123 FORTRAN Programming*
Ec 220 Labor Economics
Ec 223 Collective Bargaining
Ec 224 Economic Development
Ec 225 International Trade
Ec 226 International Investment and Finance
Ec 227 Economic Geography of North America, Europe, and the Soviet Union
Ec 228 Economic Geography of Asia, Africa, and Latin America
Ec 229 Comparative Economic Systems
Ec 230 Business Cycles
Ec 236 Public Finance
Ec 241 Microeconomics I
Ec 245 Consumer Economics
Ec 251 Macroeconomics I
Ec 252 Macroeconomics II
Ec 395-396 Independent Research
Ec 397 Seminar
Ec 398 Topics
Mth 105 Introductory Calculus I
Mth 106 Introductory Calculus II

MANAGEMENT AND INDUSTRIAL RELATIONS

Acc 233 Cost Accounting
BA 227 Logistics and Distribution Management
BA 240 Property Insurance
BA 241 Life Insurance
BA 256 Business and Society
BA 271 Human Resources Management
BA 325 International Business Management
BA 352 Operations and System Management **or**
BA 354 Organizational Design and Behavior**
BA 395-396 Independent Research
BA 398 Topics
CS 115 Survey of Computers and Data Processing **or**
CS 124 COBOL Programming*
Ec 220 Labor Economics
Ec 223 Collective Bargaining
Mth 105 Introductory Calculus I
Mth 106 Introductory Calculus II
Mth 262 Operations Research
PS 218 Public Administration
PS 318 Public Personnel Administration
Psy 232 Human Behavior
Psy 243 Industrial Psychology
Soc 265 Sociology of Work
COM 202 Interpersonal Communication
COM 206 Business and Professional Speaking
COM 303 Organizational Communication

MARKETING

A minimum of 12 credits from the following Business Administration courses:

BA 223 Advertising
BA 224 Salesmanship
BA 227 Logistics and Distribution Management
BA 240 Property Insurance
BA 241 Life Insurance
BA 261 Principles of Retailing
BA 264 Retail Buying
BA 395-396 Independent Research
BA 398 Topics

And any two of the following courses for a maximum of 6 credits:

Ec 224 Economic Development
Ec 225 International Trade
Ec 226 International Investment and Finance
Ec 245 Consumer Economics
Eng 202 Technical Writing
Mth 105 Introductory Calculus I
Mth 106 Introductory Calculus II
Psy 221 Developmental Psychology **or**
Psy 232 Human Behavior
COM 102 Principles of Communication
COM 202 Interpersonal Communication
COM 206 Business and Professional Speaking
COM 302 Public Relations
SOC 260 Personality, Culture, and Society

INTERNATIONAL BUSINESS

Ec 224 Economic Development
Ec 225 International Trade
Ec 226 International Investment and Finance
Ec 227 Economic Geography of North America, Europe, and the Soviet Union
Ec 228 Economic Geography of Asia, Africa, and Latin America
Ec 229 Comparative Economic Systems
BA 252 Operations and Systems Management **or**
BA 254 Organizational Design and Behavior**
BA 256 Business Policies and Corporate Responsibilities
BA 395-396 Independent Research
BA 398 Topics
Ant 270 Cultural Anthropology
Two semesters of a Foreign Language at the 204 competency.

Any of the following History courses, to a maximum of 6 credits:

Hst 328 United States Foreign Policy
Hst 356 Europe In the Twentieth Century
Hst 361-362 History of the Far East
Hst 348 History of Russia

Any of the following Political Science courses, to a maximum of 6 credits:

PS 105 Comparative Government
PS 202 International Relations
PS 323 Democratic Systems
PS 324 Communist Systems
PS 325 Politics of Developing Areas
PS 329 International Law and Organization

*A Computer Science course may not be used to satisfy both the Business Administration core and serve as a concentration elective.

**BA 352 or BA 354 may not be used to satisfy both the Business Administration core and serve as a concentration elective.

Business Administration Minor (Prerequisite: Ec 101, 102)

(24 credits, including Ec 101, 102)

1. **Finance**

Required: Acc 121 Elementary Acc I; Acc 122 Elementary Acc II; BA 225 Managerial Finance; BA 226 Investments

Electives: Two of the following:

Ec 201 Money and Banking; Ec 226 International Investment and Finance; Ec 236 Public Finance; BA 241 Life Insurance

2. **Marketing**

Required: BA 222 Principles of Marketing

Electives: Five of the following:

BA 223 Advertising; BA 224 Salesmanship; BA 227 Logistics; BA 233 Legal Environment; BA 261 Principles of Retailing; BA 264 Retail Buying; COM 302 Public Relations

3. **Management**

Required: Acc 121 Elementary Acc I; Acc 122 Elementary Acc II; BA 351 Management; BA 354 Organiz. Design & Behavior

Electives: Two of the following:

BA 225 Managerial Finance; BA 256 Business and Society; BA 271 Human Resources Management; BA 325 International Business Management; BA 352 Op. Sys. & Mgmt.; Ec 223 Collective Bargaining

4. **Quantitative Business Analysis.** If this area is chosen, the student is advised to take Mth 105-106, or Mth 111-112 as a sequence in the Math/Science core.

Required: BA 352 Op. Sys. & Mgmt.; Ec 231 Statistics I; Ec 232 Statistics II

Electives: Three of the following:

BA 227 Logistics; Ec 241 Microeconomics; Ec 242 Advanced Microeconomics; Mth 262 Operations Research

BA 101. INTRODUCTION TO BUSINESS **Three credits**

Designed to orient students to the framework within which business enterprises function in the economy. Stress is placed on organization and management of the enterprise, decision-making within the enterprise, small business operations, and problems of financial resources. (Not open to Business Administration majors.)

BA 209. BUSINESS CORRESPONDENCE AND REPORTS **Three credits**

An emphasis on written communications: practice in writing major classification of business letters; persuasive requests and refusals, inquiry, order, sales, application, credit, collection, and goodwill letters. Investigative techniques of research and analytical report writing.

Prerequisite: Junior standing.

BA 212. GOVERNMENT AND BUSINESS **Three credits**

A study of the relationship of government to economic enterprises with special attention to conditions in the United States; the regulatory activities of government agencies; administrative methods, objectives, and results of governmental control. Reference is made to monopoly

and quasi-monopoly situations, public utilities, trusts, transportation, extractive industries, and public enterprise.

BA 220. REAL ESTATE **Three credits**

Economic theories of value applied to real estate, valuation as a guide to decisions, market analysis, real estate, finance, property development and management, locational theory and site selection.

BA 222. MARKETING **Three credits**

An introduction to the planning and activities of marketing. Emphasis on budgeting, product conception and development, pricing, distribution channels and promotion.

Prerequisite: Junior/Senior standing.

BA 223. ADVERTISING **Three credits**

A managerial analysis of the decisions involved in advertising. Topics include research, ethics, campaign design, copy, art, media, budgeting, and effectiveness.

Prerequisite: BA 222.

BA 224. SALESMANSHIP **Three credits**

The role of salesmanship in the economic system and motives behind all buying. The principles and art of selling with emphasis on industrial selling; the techniques of prospecting, presentation, handling objections, closing, follow-through including sales demonstration.

Prerequisite: BA 222.

BA 225. MANAGERIAL FINANCE **Three credits**

A study of the financial theories and decision-making models relating to: financial analysis and planning; working capital management; cash budgeting; capital asset acquisitions; capital asset financing; cost of capital; capital structuring; acquisitions; divestitures; and reorganizations.

Prerequisite: Junior/Senior standing.

BA 226. INVESTMENTS **Three credits**

A survey of the features and characteristics of investment instruments; the operation and regulation of security markets; the techniques of security analysis and valuation; financial intermediaries; modern and traditional portfolio theory and management.

Prerequisite: Junior/Senior standing.

BA 227. LOGISTICS AND DISTRIBUTION MANAGEMENT **Three credits**

Development and organization of the domestic and international transportation system; regulatory considerations. Distribution management practices; e.g., rates, routes, scheduling, services, insurance, materials handling, warehousing.

Prerequisite: BA 222.

BA 233. THE LEGAL ENVIRONMENT OF BUSINESS **Three credits**

This course provides a foundation for business managers to operate within the legal environment in which all businesses in our society function. It provides an overview of law and our legal system, the lawmaking and adjudicatory processes, and the roles of economic, social, and political forces in the shaping of constraining legal rules and regulations.

BA 234. BUSINESS LAW AND ETHICAL RESPONSIBILITY **Three credits**

An in-depth study of contracts, commercial transactions, the Uniform Commercial Code, business organizations, property law, liability of accountants, and debtor-creditor relationships. Provides the necessary legal background for those entering the accounting profession.

Prerequisite: BA 233.

BA 240. PROPERTY INSURANCE **Three credits**

A study of the principles of property and liability insurance applied to the needs of individuals and organizations. Course content includes risk management, types of insurance and public policy issues.

BA 241. LIFE INSURANCE **Three credits**

A study of the principles of life and health insurance on both an individual and group basis. Course content includes types of insurance, insurer operations and public policy issues.

BA 256. BUSINESS AND SOCIETY **Three credits**

A course dealing with the problems faced by managers in responding to issues such as: the kinds and extent of social responsibility to be assumed by businesses, employee rights, consumerism, and the balance of public and private interests.

Prerequisite: Junior/Senior standing.

BA 261. PRINCIPLES OF RETAILING **Three credits**

A basic course that discusses opportunities in retailing; types of retail institutions; problems of store policy, store location; study of organizational structure of department stores; organization and functions of all store divisions.

Prerequisite: BA 222.

BA 264. RETAIL BUYING **Three credits**

A study of the principles of what, when, and how much to buy; a study of customer demand. Special attention is given to the technique of buying; markups, markdowns, stock turns, and other factors that are necessary to keep lines complete.

Prerequisite: BA 261.

BA 271. HUMAN RESOURCES MANAGEMENT **Three credits**

A survey of the activities and decision-making functions of the human resources manager, including manpower planning, employee rights, EEOC dealings, training and development, employee evaluation techniques, compensation packages, and personnel recruitment.

Prerequisite: Junior/Senior standing.

BA 325. SEMINAR ON INTERNATIONAL BUSINESS MANAGEMENT **Three credits**

An introduction to the field of international business. The empirical dimensions of the world economy; business enterprise in international trade; trade channels; effects of economic, political and social environment on international management problems of international operations; the role of government in fostering international business. A substantial amount of writing is required.

Prerequisite: BA 351 and senior standing.

BA 351. MANAGEMENT OF ORGANIZATIONS **Three credits**

Introduction to the theory and practice of managing organizations, including planning, organizing, and controlling. Interdisciplinary in nature, social and ethical dimensions of managing are examined.

Junior standing.

BA 352. OPERATIONS AND SYSTEMS MANAGEMENT **Three credits**

Principles of decision-making, systems design, introduction to quantitative tools of analysis; fundamentals of production, inventory, financial, and distribution management.

Prerequisite: BA 351.

BA 354. ORGANIZATIONAL DESIGN AND BEHAVIOR **Three credits**

A behavioral science approach to understanding individual, formal, and informal group behavior; macro- and micro-organizational structures, motivation and leadership theories, group influences, conflicts, decision-making, communication, with emphasis on behavioral science applications in developing organizational effectiveness.

Prerequisite: BA 351.

BA 360. BUSINESS POLICY AND DECISION-MAKING SEMINAR **Three credits**

A capstone course that integrates the functional areas of business from the point of view of top management. Emphasis is on the role of management in the formation of strategic and long-range plans. A substantial writing component is included.

Prerequisite: BA 351 and senior standing.

BA 395-396. INDEPENDENT RESEARCH **One to three credits**

Independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.

BA 397. SEMINAR **(Maximum of three credits per student) One to three credits**

Presentation and discussions of selected topics.

BA 399. COOPERATIVE EDUCATION **Three or six credits**

Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)

Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

BA 198/298/398. TOPICS **Variable credit**

Lectures on subjects of special current interest in business which are not covered in other courses.



ECONOMICS

Associate Professor Peper, Chairperson; Professors Emeritus Farrar, Werner; Professor Taylor; Associate Professors DeYoung, Seeley, Williams.

Total minimum number of credits required for a major in Economics leading to the B.A. degree — 122.
Total minimum number of credits required for a minor — 24.

The Department of Business and Economics offers both a major and minor in economics. The major program is designed for those students seeking a rigorous exposure to the theoretical explanations of the behavior of an economic system, and the economic decisions and policies which flow from the theories. It is a major with inherent flexibility which allows a student to design an educational program tailored to his or her needs and interests.

The economics curriculum is quite quantitative. Consequently, a student majoring in economics should ensure that his or her liberal arts core includes mathematical preparation through at least introductory calculus (Math 105-106). It is also recommended that an economics major choose a foreign language from the humanities electives.

All economics majors must take Economics 101-102. This gives them opportunities to experience the full range of the discipline and to consider where economists may bring to bear their unique expertise. In addition, all majors must take Money and Banking, Economic Statistics, Intermediate Macroeconomics, and Intermediate Microeconomics. Beyond these requirements, majors are encouraged to explore specializations which might be of particular interest to them and best prepare them for their prospective careers.

For students who have chosen other majors, a minor in economics often is a valuable complement. Its ability to bring into sharp focus the economic issues and problems subsumed in such areas as history, pre-law, music, or engineering make it a valuable career asset.

Economists find that opportunities to apply their skill and knowledge exist in all sectors of the economy. Businesses of every description have economists on their staffs. Governmental bodies and not-for-profit organizations also are major employers of economists. However, a career in higher education often is the one chosen by economists.

In all of the above cases, further study at the graduate level is virtually a necessity. Because Wilkes graduates have had ready access to the most prestigious graduate schools, our alumni are to be found in a variety of meaningful careers where they are making significant contributions.

Minor in Economics

Students choosing to minor in Economics must choose one of the following four areas and must take Economics 101-102 as prerequisites.

1. **Quantitative Economics**

Ec 231	Applied Economic Statistics I — Univariate Analysis
Ec 232	Applied Economic Statistics II — Multivariate Analysis
Ec 241	Microeconomics I
Ec 242	Microeconomics II
Ec 251	Macroeconomics I
Ec 252	Macroeconomics II

2. **Economic Finance**

BA 225	Managerial Finance
Ec 201	Money and Banking
Ec 226	International Investment and Finance
Ec 230	Business Cycles
Ec 231	Applied Economic Statistics I — Univariate Analysis
Ec 232	Applied Economic Statistics II — Multivariate Analysis

3. **International Economics**

Ec 224	Economic Development
Ec 225	International Trade
Ec 226	International Investment and Finance
Ec 227	Economic Geography of North America, Europe, and the Soviet Union
Ec 228	Economic Geography of Asia, Africa, and Latin American
Ec 229	Comparative Economic Systems

4. **Economic Policy**

BA 212	Government and Business
Ec 201	Money and Banking
Ec 220	Labor Economics
Ec 229	Comparative Economic Systems
Ec 230	Business Cycles
Ec 236	Public Finance

Recommended Course Sequence for a Degree with a Major in Economics

First Semester		Second Semester	
Eng 101 Composition I	3	Eng 102 Composition II	3
Mth 105 Calculus I	4	Mth 106 Calculus II	4
Core Requirements	6	Core Requirements	9
CST 101 Core Studies I	1	PE 100 Activity	0
CS 115 Survey of Computers	3		16
PE 100 Activity	0		
	17		

Third Semester		Fourth Semester	
Ec 101 Economics I	3	Ec 102 Economics II	3
Core Requirements	9	Core Requirements	9
Free Elective	3	Free Elective	3
	15		15

Fifth Semester		Sixth Semester	
Ec 231 Statistics I	3	Ec 232 Statistics II	3
Ec 201 Money and Banking	3	Major Elective	3
Ec 241 Microeconomics I or	3	Free Electives	9
Ec 251 Macroeconomics I			15
Free Electives	6		
	15		

Seventh Semester		Eighth Semester	
Ec 241 Microeconomics I or	3	Major Elective	3
Ec 251 Macroeconomics I		Free Electives	12
Major Elective	3		15
Free Electives	9		
	15		

EC 101. PRINCIPLES OF ECONOMICS I **Three credits**

Presents basic economic problems and shows how these problems are solved in a free enterprise economy; the effects of the increasing importance of the economic role of government; the nature of national income and the modern theory of income determination; how money and banking, fiscal policy, and monetary policy fit in with income analysis and keep the aggregate system working. The course deals mainly with macroeconomic problems.

Prerequisite: Sophomore standing.

EC 102. PRINCIPLES OF ECONOMICS II **Three credits**

Based upon a broad microeconomic foundation concentrating on such units as the consumer, the firm, and the industry. A general view of the free market system; the economics of the firm and resource allocation under different market structures; production theory; pricing and employment of resources; economic growth and development.

Prerequisite: Ec 101.

EC 201. MONEY AND BANKING **Three credits**

A study of money, credit, and banking operations. Monetary standards, development of the American monetary and banking system. Recent development in other financial institutions. Central banking and the Federal Reserve System; instruments of monetary control; international monetary relationships.

EC 220. LABOR ECONOMICS **Three credits**

A study of the forces that determine labor market outcomes such as wage rates, employment levels, and productivity of the workforce. Emphasis will be placed upon the various measures of labor supply as well as the differences in the demand for labor in competitive versus noncompetitive markets. Key topics will include: the various types of unemployment; search theory; the impact of legal and illegal immigration; collective bargaining and the economics of unions; labor market discrimination and comparable worth.

Prerequisite: Ec 101 and 102.

EC 223. COLLECTIVE BARGAINING **Three credits**

An introduction to labor problems and an analysis of major issues in the field of labor. This course deals with collective bargaining, employment, wages, hours, and union policies. Governmental participation in labor relations and collective bargaining are also investigated. Reference is made to social welfare devices such as social security, unemployment compensation, and workmen's compensation.

EC 224. ECONOMIC DEVELOPMENT **Three credits**

A study of the problems of development and growth in developed and less developed countries and how they can achieve growth and development. Topics stressed include population, financing development, planning and programming development, as well as theories of economic development.

EC 225. INTERNATIONAL TRADE **Three credits**

Classical and Neo-classical theories of trade; qualifications of the pure theory; new theories of trade; the transfer of international payments and the determination of foreign exchange rates; the balance of international payments; tariffs and other trade barriers; United States commercial policy and the General Agreement on Trade and Tariffs; current issues.

EC 226. INTERNATIONAL INVESTMENT AND FINANCE **Three credits**

Theories of direct foreign investment; the nature and scope of multinational enterprise; international payments adjustments under alternative monetary systems; the collapse of the Bretten Woods System; the contemporary international monetary system; proposals for monetary reform; U.S. balance of payments problems and the status of the dollar.

EC 227. ECONOMIC GEOGRAPHY OF NORTH AMERICA, EUROPE, AND THE SOVIET UNION **Three credits**

A study and analysis of the characteristics, potentials, and problems of the more advanced nations of the Northern Hemisphere.

EC 228. ECONOMIC GEOGRAPHY OF ASIA, AFRICA, AND LATIN AMERICA **Three credits**

A study and analysis of the characteristics, potentials, and problems of the less developed nations of the world.

EC 229. COMPARATIVE ECONOMIC SYSTEMS **Three credits**

The institutions of a market economy are analyzed as a foundation for purposes of comparisons. Marxist theory of prices, wages, and the demise of capitalism is studied in order to establish the theoretical basis of Socialism and Communism. Particular stress is placed on the performance of the Soviet economy. Attention is also given to important operational aspects of the Chinese, British, and Swedish systems.

EC 230. BUSINESS CYCLES **Three credits**

Historical analysis of major business cycles. Contemporary theories and a critical examination of public policy toward business cycles. Forecasting with econometric models.

EC 231. APPLIED ECONOMIC STATISTICS I — UNIVARIATE ANALYSIS **Three credits**

An introduction to the primary tools of research in economics and business. The major topics are estimation and test design using sample means and proportions with applications in economics, accounting, finance, marketing and management. The three hours of lecture per week are complemented by a mandatory two-hour laboratory emphasizing problem solving. Fee: $20.

Prerequisite: Ec 101, 102 and 6 hours of mathematics.

EC 232. APPLIED ECONOMIC STATISTICS II — MULTIVARIATE ANALYSIS **Three credits**

An introduction to those aspects of research in economics and business in which information on two or more variables is utilized. The major topics are Chi Square Tests, One-Way and Two-Way Analysis of Variance, General Regression and Correlation, Time Series Analysis and Forecasting. A mandatory two-hour laboratory accompanies the three hours of lecture per week. Fee: $20.

Prerequisite: Ec 231 or permission of instructor.

EC 234. ECONOMIC RESEARCH **Three credits**

The purpose of this course is to provide an introduction to the methods and logic of linear programming, input output analysis, queuing theory, index numbers, and other techniques of research in economics. Students are advised to take Ec 101 and 102 to obtain the theoretical background for this course.

EC 236. PUBLIC FINANCE **Three credits**

Fundamental principles of public finance; government expenditures; revenue; financial policies and administration; taxation; principles of shifting and incidence of taxation; public debt and the budget; fiscal problems of federal, state, and local government; the relation of government finance to the economy.

EC 241. MICROECONOMICS I **Three credits**

The study of the interaction between households and businesses in product and resource markets. Topics covered include consumer preferences, production theory, cost analysis, market structures and the determination of wages and prices.

EC 242. MICROECONOMICS II **Three credits**

The study of the market system as a whole, through welfare economics and general equilibrium analysis with emphasis on social preferences, market failure, and policy alternatives.

Prerequisite: Ec 241 or permission of instructor.

EC 245. CONSUMER ECONOMICS **Three credits**

The place of the consumer in the economic system. Theories of consumption; problems of the individual consumer as affected by income and taxes; consumer habits and standard of living; trends in consumption, income disposition, marketing and pricing of consumer products. Relationships between government activities and the consumer are emphasized.

EC 251. MACROECONOMICS I **Three credits**

The study of behavior of the important economic aggregates; national income, consumption, investment, public spending, and taxes. Special emphasis is on the problems of inflation and unemployment and the post-Keynesian search for their causes and solutions.

EC 252. MACROECONOMICS II **Three credits**

An introduction to the Keynesian and Neoclassical growth theory and the various explanations of behavior of consumption, investment, unemployment, and inflation. The course is designed to present an alternative treatment of some topics covered in Macroeconomics I and to extend the student's knowledge into areas not covered.

EC 395-396. INDEPENDENT RESEARCH **One to three credits**

Independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.

EC 397. SEMINAR **(Maximum of three credits per student) One to three credits**

Presentations and discussions of selected topics.

EC 399. COOPERATIVE EDUCATION **Three or six credits**

Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)

Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

EC 198/298/398. TOPICS **Variable credit**

Lectures on current issues and developments in economics.

INDIVIDUALIZED STUDIES

This program is designed for those capable and motivated students who wish to undertake a course of study that cannot be provided for under any of the normal B.A., B.S. degree programs. The student will be responsible for generating a coherent proposal for a program of studies. This proposal must be selected by the student, approved by an advisor, and then by the Individualized Studies Committee. The program of studies may include courses offered by all departments at Wilkes University. In addition, credit may be assigned for appropriate off-campus study, work, and/or travel. Credits may be granted for knowledge or experience obtained prior to enrollment, with approval of the appropriate department and the Individualized Studies Committee.

Degree Requirements

The basic requirement for the degree in Individualized Studies is the accumulation of 121 credits. Although there are no specific course requirements, the spirit of the Wilkes University core curriculum is to be respected.



INTERNATIONAL STUDIES

Associate Professor Merryman, International Studies Advisor.

Total minimum number of credits required for a major in International Studies leading to the B.A. degree — 121.

The interdisciplinary major in International Studies (I.S.) provides an excellent liberal arts preparation for a variety of careers and professions. The major is structured to permit concentration in fields leading to specific careers in business, government, international organizations, the military, teaching, or any technical or arts field. It is also structured to permit a period of study abroad with easy transfer of credits to the major.

The total number of hours required for graduation with an International Studies major is 121, of which 46 are the core requirements and 33 are major requirements. For the International Studies major, the following courses at the introductory level are required, some of which can be counted in the core: History 101-102; Economics 101-102; Political Science 105; Anthropology 101; and Foreign Language at 204 competence. Students are also required to take 6 hours of advanced Foreign Language beyond the 204 level. In addition, students must complete 2 courses from among Anthropology 270, Political Science 202, and Economics 229, plus one course from among Economics 224, 225 and 226.

Before completing the International Studies major requirements, students should select the **area of concentration** in which 12 more credits are required. Options for this concentration are one of several culture areas (Asia, Communist Societies, Third World, or Western Europe), or International Economics, or International Politics, or Language. Specific courses contributing to one of these concentrations and the I.S. core requirements will be worked out with the International Studies Advisor and may include courses taken while studying abroad at another institution. Major electives in the areas of concentration are listed below.

Culture Areas:

Asia
- Anthropology 270, 352, and/or 392
- Economics 224, 225, 228, and/or 229
- History 361, 362, 363, 364, 365, and/or 367
- Political Science 202 and/or 325, 329

Communist Societies
- Economics 224, 225, 227, and/or 229
- History 348, 362 (or 363), and/or 365
- Philosophy 230
- Political Science 202 and/or 324, 329

Third World
- Anthropology 270, 352, 353, and/or 392
- Economics 224, 225, 226, and/or 228
- History 363, 365, 367
- Political Science 202 and/or 325, 329
- Sociology 252
- Spanish 209 and/or 309

Western Europe
- Economics 224, 227, and/or 229
- French 208, 298, and/or 302
- German 208, 298, and/or 302
- History 342, 356, and/or 376
- Political Science 202 and/or 323, 329
- Sociology 352
- Spanish 208, 298, and/or 302

(NOTE: No more than six hours may be taken in any one discipline listed under individual area concentrations.)

International Economics:
- Economics 224, 225, 226, 227, 228, and/or 229

International Politics:
- History 328, 348, 364, and/or 376
- Political Science 202, 323, 324, 325, and/or 329

(NOTE: No more than 6 hours in History may be taken in this concentration.)

Modern Foreign Language:
- 12 hours of advanced foreign language courses beyond International Studies core

Except in unusual circumstances, it is expected that International Studies majors will spend a summer, semester, or year abroad in a suitable program of academic study arranged through the Wilkes Study Abroad Program Coordinator. Credits earned abroad may be applied towards satisfying International Studies major requirements.

Students in the International Studies major have 35-39 credit hours of free electives. Students are urged to take additional language credits to constitute a language minor or major. It is also possible to use electives to constitute a second major in a discipline such as Economics, History, or Political Science.

Advising for the International Studies major is done in the Anthropology Department.

Recommended Course Sequence for International Studies Major

First Semester		Second Semester	
Eng 101 Composition I	3	Eng 102 Composition II	3
Hst 101 World Civilization I	3	Hst 102 World Civilization II	3
Ec 101 Principles of Economics I	3	Ec 102 Principles of Economics II	3
Ant 101 Intro. to Anthropology	3	PS 105 Comparative Government	3
Foreign Language*	3	Foreign Language*	3
CST 101 Core Studies I	1	PE 100 Activity	0
PE 100 Activity	0		15
	16		

Third Semester		Fourth Semester	
Ant 270 Cultural Anthropology and/or		Ec 224 Economic Development and/or	
PS 202 International Relations and/or		Ec 225 International Trade and/or	
Ec 229 Comparative Economic Systems*	6	Ec 226 International Investment and Finance*	3
Foreign Language*	3	Foreign Language*	3
Core Requirements	6	Core Requirements	6
	15	Major Elective	3
			15

Fifth Semester		Sixth Semester	
		Study Abroad**	
	15		15

Seventh Semester		Eighth Semester	
Foreign Language	3	Foreign Language	3
Major Electives	6	Major Elective	3
Core Requirements	6	Core Requirement	3
	15	Free Elective	3
		Senior Seminar*	3
			15

*These courses are required for all International Studies Majors.

**Students may elect to spend their junior year on campus. Courses will be selected in consultation with the International Studies Advisor.

POLITICAL SCIENCE AND PUBLIC ADMINISTRATION

Associate Professor Engel, Acting Chairperson; Professor Emerita Driscoll; Professor Waldner; Assistant Professors Auerbach, Henehan, Tuhy.

Total minimum number of credits for a major in Political Science leading to the B.A. degree — 121.

Total minimum number of credits for a minor — 18.

Total minimum number of credits for a concentration in Public Administration — 33.

A major in Political Science requires 121 hours. These include 46 hours in the Core and 33 hours in Political Science. All students must take PS 102, 105, 201, 202 and 238 plus 18 advanced hours.

Students may choose to concentrate in Public Administration by taking 33 hours. Students must take the departmental requirements (PS 102, 105, 201, 202 and 238) and then choose 18 additional hours from PS 218, 314, 316, 318, 319, 354, 398. Students must take 6 hours of cognate courses (see semester by semester program). PS 394 is recommended but not required.

A minor in Political Science requires PS 102 and 105 plus 12 hours of advanced courses. Students must take a concentration of 9 hours in one area chosen from American Government, Comparative/International Politics, or Public Administration.

Students who major in Political Science have a wide variety of career options in government, law, education, social service and business.

See Pre-Law for information on law school admission.

Recommended Course Sequence for a Major in Political Science

First Semester		Second Semester	
Eng 101 Composition I	3	Eng 102 Composition II	3
PS 102 American Government or		PS 102 American Government or	
PS 105 Comparative Government	3	PS 105 Comparative Government	3
Core Requirements	9	Core Requirements	9
CST 101 Core Studies I	1	PE 100 Activity	0
PE 100 Activity	0		15
	16		

Third Semester		Fourth Semester	
PS 201 Political Theory	3	PS 202 International Relations	3
Core Requirements	12	PS 238 Concepts and Methods	3
		Core Requirements	9
	15		15

Fifth Semester		Sixth Semester	
Major Electives	6	Major Electives	6
Free Electives	9	Free Electives	9
	15		15

Seventh Semester		Eighth Semester	
Major Elective	3	Major Elective	3
Free Electives	12	Free Electives	12
	15		15

Recommended Course Sequence for Concentration in Public Administration

First Semester		Second Semester	
Eng 101 Composition I	3	Eng 102 Composition II	3
PS 102 American Government or		PS 102 American Government or	
PS 105 Comparative Government	3	PS 105 Comparative Government	3
Ec 101 Principles of Economics	3	Mth 150 Statistics	3
Core Requirements	6	Core Requirements	6
CST 101 Core Studies I	1	PE 100 Activity	0
PE 100 Activity	0		15
	16		

Third Semester		Fourth Semester	
PS 201 Political Theory	3	PS 202 International Relations	3
Major Elective	3	PS 238 Concepts and Methods	3
Core Requirements	9	Core Requirements	9
	15		15

Fifth Semester		Sixth Semester	
Public Administration Electives (Two Courses from PS 218, 314, 316, 318, 319, 354, or 398)	6	Public Administration Electives (Two Courses from PS 218, 314, 316, 318, 319, 354, or 398)	6
Core Requirement	3	Free Electives	9
Free Electives	6		15
	15		

Seventh Semester		Eighth Semester	
Public Administration Elective (One course from PS 218, 314, 316, 318, 319, 354, or 398)	3	PS 354 Practicum*	6
Free Electives	12	Free Electives	9
	15		15

*Recommended

PS 102. INTRODUCTION TO AMERICAN POLITICS **Three credits**

A descriptive and analytical study of the theory and practice of American government, its constitutional basis, organization, powers, functions, and problems.

Offered every semester.

PS 105. COMPARATIVE GOVERNMENT **Three credits**

An introductory survey of political systems and processes. Emphasis will be placed on categories and methods of comparison, as well as on issues and problems confronted by selected countries of Europe, Asia, Africa, and Latin America.

Offered every semester.

PS 201. INTRODUCTION TO POLITICAL THEORY **Three credits**

An introductory survey of Western political theory from the ancient Greeks to Karl Marx. Students will be exposed to classic political theory by reading primary rather than secondary sources. The course will emphasize the examination and evaluation of political concepts.

Offered every fall.

PS 202. INTRODUCTION TO INTERNATIONAL RELATIONS **Three credits**

A survey of major issues and problems underlying the relations among nations. The domestic, ideological, and international determinants of foreign policy will be explored, and some of the dominant theories and assumptions in the study of international relations will be analyzed.

Offered every spring.

PS 218. INTRODUCTION TO PUBLIC ADMINISTRATION **Three credits**

An introduction to the principles and problems of public administration in an increasingly complex society. Attention to such topics as leadership, informal organizational processes (infrastructure), the relation of administration to its cultural context, and the question of administrative responsibilities. Survey of the technical problems of personnel, finance, and administrative law.

Prerequisite: PS 102 or consent of instructor.

Offered in alternate years.

PS 238. CONCEPTS AND METHODS IN POLITICAL SCIENCE **Three credits**

Survey of the major concepts, theories, and methods of current political science as a discipline. Some attention to research design and techniques.

Prerequisite: PS 102 or 105.

Offered in alternate years.

PS 301. POLITICAL DYNAMICS **Three credits**

A study of the various modes of citizen political participation in the United States. The role of public opinion, voting, political parties, interest groups, and political movements will be examined and evaluated. Case studies will be introduced throughout.

Prerequisite: PS 102.

Offered in alternate semesters.

PS 307. THE AMERICAN PRESIDENCY **Three credits**

An exploration and analysis of the development and changing role of the American President as political leader, decision-maker, world leader. Examines the selection and election process and the effect of this process on the Presidency.

Prerequisite: PS 102 or consent of instructor.

Offered in alternate years.

PS 312. INTERGOVERNMENTAL RELATIONS **Three credits**

Analysis of the process by which multiple public jurisdictions interact in the United States Federal System, and the impact of this process on public policy.

Prerequisite: PS 102.

Offered in alternate years.

PS 314. PLANNING IN URBAN DEVELOPMENT **Three credits**

Origins and evolution of city planning, influences of urban growth, legal and institutional framework, and scientific and philosophical premises. Survey of city planning as it has evolved in the United States since 1800 in response to physical, social, and economic problems.

Prerequisite: PS 102.

Offered in alternate years.

PS 316. GOVERNMENT BUDGETING **Three credits**

An examination of the political and administrative aspects of the government budgeting process, including the possibilities and consequences of recent budgetary reforms.

Prerequisite: PS 102 or consent of instructor.

Offered in alternate years.

PS 318. PUBLIC PERSONNEL ADMINISTRATION **Three credits**

Description and analysis of public personnel; methods of recruitment, assignment, promotion; the relation of the personnel function to its environment; the public service character of government employees.

Prerequisite: PS 102 or consent of instructor.

Offered in alternate years.

PS 323. DEMOCRATIC SYSTEMS **Three credits**

Comparison of the development, institutions, problems, and prospects of democratic systems in the modern world and their relation to capitalist-industrial society. Focus is on Great Britain, France, West Germany, and Japan with some attention to the Scandinavian democracies, Italy, and British Commonwealth nations.

Prerequisite: PS 102 and 105 or consent of instructor.

Offered in alternate years.

PS 324. COMMUNIST SYSTEMS **Three credits**

Analysis of the social and political conditions out of which the major Communist systems in the Soviet Union and in China developed. Marxism, Leninism, Maoism. Examines the common elements, the differing elements, problems and prospects of the two nations and their interrelationship with each other and other countries of the world. Some attention to Communism in Eastern Europe, and the Third World.

Prerequisite: PS 105 or consent of instructor.

Offered in alternate years.

PS 325. POLITICS OF DEVELOPING AREAS **Three credits**

The political process in the lesser-developed areas of the world: Asia, Africa, and Latin America. Examines the problems of economic and political change and the relations of these areas to the Western world and the Communist states.

Prerequisite: PS 105 or consent of instructor.

Offered in alternate years.

HST 328. U.S. FOREIGN POLICY **Three credits**

See description under History.

PS 329. INTERNATIONAL LAW AND ORGANIZATION **Three credits**

A study of the nature, application, and sources of public international law and how it relates to the evolution of global and regional organizations and alliances, including international non-governmental organizations and other non-state actors.

Prerequisite: PS 202 or permission of instructor.

Offered in alternate years.

PS 331. CONSTITUTIONAL LAW I **Three credits**

Study of growth and change of the American Constitution through analysis of the leading cases decided by the U.S. Supreme Court. Analysis of the powers of the three branches of government and of the relations between the states and the Federal Government.

Prerequisite: PS 102 or consent of instructor.

Offered in alternate fall semesters.

PS 332. CONSTITUTIONAL LAW II **Three credits**

Continuation of the study of the meaning of the Constitution as interpreted by the Supreme Court. Analysis of the landmark decisions regarding free speech and press, separation of church and state, rights of persons accused of crime, equal protection of the laws, voting rights.

Prerequisite: PS 102 or consent of instructor.

Offered in alternate spring semesters.

PS 335. AMERICAN POLITICAL THOUGHT **Three credits**

Study of the political ideas, ideals, and ideologies as they contributed to and developed from the American experience. Analysis of the ways of thought which underlie our political institutions and practices.

Prerequisite: PS 102 or consent of instructor.

Offered in alternate years.

PS 353. POLICY FORMATION IN THE LEGISLATURE **Three credits**

Analysis of the policy-making process in the legislature, focusing on case studies of the process in the U.S. Congress. Internal processes and external influences.

Prerequisite: PS 102 or consent of instructor.

Offered in alternate years.

PS 354. ADMINISTRATIVE LAW AND POLICY **Three credits**

Analysis of the ways in which public policy is made and effected in administrative agencies, of the ways in which the public administrator operates and the linkage between administrative organizations and other policy-makers and influencers of policy.

Prerequisite: PS 102 and 218 or consent of instructor.

Offered in alternate years.

PS 394. PRACTICUM **Three to six credits**

Internship or similar experience in administrative office, community agency, election campaign, or work related to administration or politics.

Prerequisite: At least 4 courses in PS or in Urban Studies, or in a field in which internship will be served, such as Earth and Environmental Sciences. Student must consult with department before registering.

Offered every semester.

PS 395-396. INDEPENDENT RESEARCH **One to three credits**

Independent study and research for advanced students in the major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.

Prerequisite: Approval of department.

Offered every semester.

PS 397. SEMINAR **Three credits**

Presentations and discussions of selected topics by students.

PS 399. COOPERATIVE EDUCATION **Three or six credits**

Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator

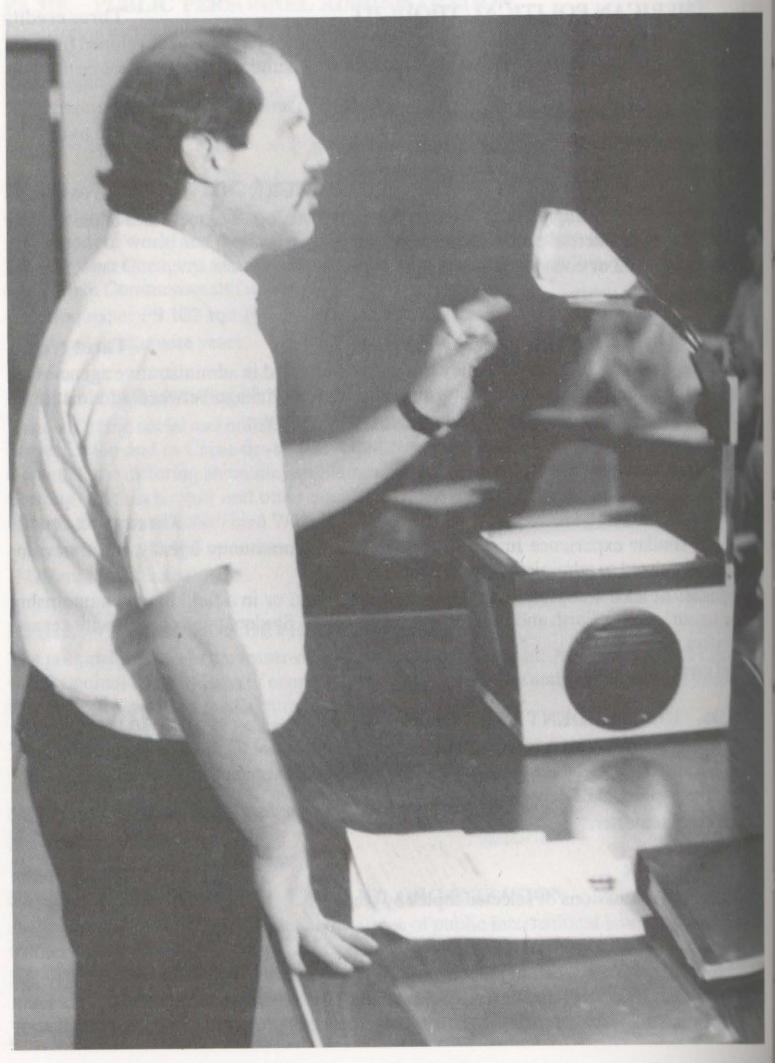
in the student's discipline. (See page 62 in Bulletin for placement procedures.)

Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

PS 198/298/398. TOPICS IN POLITICAL SCIENCE/ TOPICS IN POLICY ANALYSIS **Variable credit**

A study of topics of special interest not extensively treated in regularly offered courses. Examples of possible topics would be: leadership in Congress; minorities in the political process; women and power; urban design; the First Amendment in law and practice; equality at law in an unequal society; Marxism, etc. May be repeated when topics differ. A topics course in a specific field of public policy, such as Energy, Environmental Science, Mental Health and Retardation, etc., may be offered also.

Prerequisite: Permission of department, criterion depending on topic.



PRE-LAW STUDIES

Assistant Professor Auerbach, Advisor.

Wilkes University has developed a carefully designed pre-law advisory program which has proved able to provide exceptionally effective support for students seeking admission to graduate schools of law. The Pre-law Program at Wilkes is based on the principle that admission to, and success in, law school depends upon completion of a rigorous curriculum at the undergraduate level as well as an up-to-date understanding of the law school admission process. One of the greatest strengths of Wilkes University is its ability to provide students from different educational backgrounds with a sound education that prepares them for the challenges of leading professional schools.

Law schools do not prescribe a specific undergraduate major but rather suggest a broadly-based educational program which enhances the student's ability to reason, read analytically, and write effectively. Students interested in law school may major in any field, but the most frequently chosen areas are: political science, English, history and business administration. Majors such as sociology, nursing, biology, engineering, computer science, psychology, or earth and environmental science also provide appropriate preparation for legal studies. Indeed, a major in a technical field may be especially useful in particular aspects of legal practice.

Advising

Wilkes students are assigned to faculty advisors in the areas of their majors. These advisors guide them regarding degree requirements in particular fields. Pre-law students also consult with a designated pre-law advisor, who acquaints them with aspects of legal study and practice. Pre-law advisors have available law school catalogs, information on the Law School Admission Test (LSAT) and copies of the *Pre-law Handbook,* which contains information about all law schools accredited by the American Bar Association.

Each Wilkes pre-law student is included in regularly scheduled activities, such as seminars on legal practice, briefings on law school admissions, workshops on application preparation and interviews, and law school visits.

As the senior year approaches, pre-law advisors provide suggestions as to which law schools are most likely to admit students with particular academic records and LSAT scores. Most importantly, pre-law advisors help to overcome the myths which too often affect student thinking about law schools.

SOCIOLOGY

Associate Professor Natzke, Chairperson; Associate Professors Garr, Merryman; Assistant Professor Tuttle; Adjunct Faculty Loftus-Vergari, Tomkiewicz.

Total minimum number of credits required for a major in Sociology leading to the B.A. degree — 121.
Total minimum number of credits required for a minor — 18.

The curriculum constitutes a complete program of studies within the major, with balanced attention to a wide range of interests within the general field of sociology. The department is noted for its commitment to training students who will pursue advanced study in sociology, anthropology, social work, education, law, criminal justice, the health professions and related fields. The department emphasizes internships in professional settings which integrate academic studies with work experiences.

One of the unique features of the curriculum is the possibility of seeking dual-majors in two programs. Utilizing existing programs and courses, it is possible for students to achieve a double major in sociology and psychology, criminal justice, or other related disciplines. Career counseling is readily available within the department for students making such program commitments.

The formal requirements for the major in sociology are: (1) Soc 101 and Ant 101 (required but not accepted as credit hours toward the major); (2) twenty-four hours, including Soc 255, 370, and 380. All anthropology courses beyond Ant 101 may be taken for credit toward the major or minor in sociology. Also Phl 230 and/or 350 may be taken toward the major. Soc Analysis 394 and/or Mth 150 is strongly recommended for students planning graduate study. Courses required in one's major such as Soc 101 and Ant 101 may also be used to fulfill core requirements. The department offers Practicum 385, a supervised practical field experience, designed for sociology majors, that involves work in a professional setting. The six hours earned in Practicum may not be applied toward the twenty-four hours required for the major. Approval of the department chairperson is required before registering for Practicum.

Sociology Minor

A minor in Sociology consists of 18 hours, including Soc 101. At least one of the following courses is required. Social Psychology 255; Sociological Methods 370; Sociological Theory 380.

The department offers Practicum 385, a supervised practical field experience, designed for sociology minors, in a professional setting. The six hours earned in Practicum may not be applied toward the eighteen hours required for the minor. Approval of the department chairperson is required before registering for Practicum.

Social Work/Human Services

Students who intend to work or pursue advanced study in the field of Social Work and/or Human Services are urged to take at least three courses in Social Work, two courses in Psychology, and complete 120 hours of supervised practical field experience in a professional setting. The latter requirement may be completed through the auspices of the Cooperative Education Program.

Certification in Education

Sociology majors seeking certification in education must complete the Social Studies Certification Program. A description of the program is given on page 129.

Recommended Course Sequence for a Major in Sociology

First Semester		Second Semester	
Soc 101 Intro. to Sociology	3	Ant 101 Intro. to Anthropology	3
Eng 101 Composition I	3	Eng 102 Composition II	3
Core Requirements	9	Core Requirements	9
CST 101 Core Studies I	1	PE 100 Activity	0
PE 100 Activity	0		
	16		15

Third Semester		Fourth Semester	
Core Requirements	9	Core Requirements	9
Major Elective	3	Major Elective	3
Free Elective	3	Free Elective	3
	15		15

Fifth Semester		Sixth Semester	
Soc 255 Social Psychology	3	Major Electives	6
Major Elective	3	Free Electives	9
Core Requirement	3		15
Free Electives	6		
	15		

Seventh Semester		Eighth Semester	
Soc 370 Methods*	3	Soc 380 Sociological Theory*	3
Free Electives	12	Soc 396 Independent Research	1
	15	Free Electives	12
			16

*Students with educational aspirations beyond the bachelor's degree and/or full-time internship commitments during the eighth semester (e.g. Soc 399 Practicum 6cr, Cooperative Education 9cr, and Soc 396 Independent Research 1cr) should plan to take Soc 370 and Soc 380 in their fifth and sixth semesters respectively.

SOC 101. INTRODUCTION TO SOCIOLOGY **Three credits**
A systematic view of sociology, providing essentials for an approach to questions about man in society; analysis of social processes, structures, and functions.

SOC 200. THE FAMILY **Three credits**
History and ethnological studies of family. Role of family in the development of the individual. Interrelation of church, state, and family. Social conditions and changes affecting the American family. Family stability and disorganization.
Prerequisite: Soc 101 or Ant 101, or approval of instructor.

SOC 202. FAMILY DYNAMICS **Three credits**
Family life education orientation. Presentation of the current major ideas concerning skills necessary for effective family life is emphasized. Dating and married couples are encouraged to take this course together. Enrollment limited to 20 students.
Prerequisites: Soc 101, Ant 101, or approval of instructor.

SOC 204. FAMILY VIOLENCE **Three credits**
It is customary to think of violence between family members as infrequent and, when it does occur, as being the result of some mental defect or aberration. Research evidence shows that neither of these views is correct. This course examines the prevalence, experience, causes, and prevention of family violence.
Prerequisites: Soc 101, Ant 101, or approval of instructor.

SOC 206. SEX ROLES **Three credits**
This course deals with the origins of sex roles, the historical changes in sex roles, the consequences of sex roles to the individual and to society, and the outlook for sex roles in the future.
Prerequisites: Soc 101, Ant 101, or approval of instructor.

SOC 230. SOCIAL PROBLEMS **Three credits**
A survey of most pressing contemporary social problems and an examination of current theories of social disorganization.
Prerequisite: Soc 101 or Ant 101, or approval of instructor.

SOC 235. CRIME AND JUVENILE DELINQUENCY **Three credits**
Evaluation of current theories and research into causative factors and sociological implications of criminal and delinquent behavior. Examination of problems, programs, and issues in prevention and treatment of deviant behavior.
Prerequisite: Soc 101 or Ant 101, or approval of instructor.

SOC 240. MEDICAL SOCIOLOGY **Three credits**
Surveys findings and methods in current applications of sociology to medicine. Includes a consideration of large and small scale social influences on the organization of medical institutions and practices.
Prerequisites: Soc 101, Ant 101, or permission of the instructor.

SOC 241. THE SOCIOLOGY OF MENTAL DISORDERS **Three credits**
Reviews major sociological approaches to the generation and treatment of psychiatric disorders. Attention is given to anti-psychiatric theories of mental disorders which construe 'mental disorders' as primarily social phenomena.
Prerequisites: Soc 101, Ant 101, or permission of the instructor.

SOC 242. SOCIAL GERONTOLOGY **Three credits**
Considers major findings about the social organization of aging and dying. Reviews history, present and future implications of the rapidly expanding population of elderly.
Prerequisites: Soc 101, Ant 101, or permission of the instructor.

SOC 250. SOCIAL STRATIFICATION **Three credits**
A survey of the structure and dynamics of social inequality in American life. Attention is focused on the institutionalization of power arrangements that perpetuate intergenerational patterns of economic, political, and prestige inequalities among collectivities. A special effort is made to compare the consequences of structured social inequality for the very wealthy and the very poor.
Prerequisites: Soc 101, Ant 101, or permission of instructor.

SOC 251. FIELDS OF SOCIAL WORK **Three credits**
A survey of the main problems of social work and of agencies and methods that have developed to cope with them. The nature and requirements of the different fields of social work.
Prerequisite: Soc 101 or Ant 101 or Psy 101-102, or approval of instructor.

SOC 252. COMPARATIVE SOCIAL WELFARE SYSTEMS **Three credits**
Examination of the social welfare institution within a societal and cultural context. Exploration of historical and conflicting views on responsibility for developing measures to cope with social problems in North American, European, Asiatic, and African countries.
Prerequisite: Soc 101 or Ant 101, or approval of instructor.

SOC 253. INTERVENTIVE STRATEGIES IN SOCIAL WORK **Three credits**
A survey of the strategies used by social workers, and other professionals in human services, to intervene in the problems manifested by their clients, such as drug and alcohol abuse, child abuse, family violence, mental disorders, mental retardation, poverty, and the crises of the elderly.

SOC 255. INTRODUCTION TO SOCIAL PSYCHOLOGY **Three credits**
A general survey of the field of social psychology. Social factors in human nature; psychology of individual differences; social interaction; collective behavior; psychology of personality; social pathology.
Prerequisite: Soc 101 or Ant 101 or Psy 101-102, or approval of instructor.

SOC 260. PERSONALITY, CULTURE, AND SOCIETY **Three credits**
Examination of current theories and research bearing upon the relationship among personality, culture, and society; contributions and convergent development in psychology, anthropology, and sociology.
Prerequisite: Soc 101 or Ant 101 or Psy 101-102, or approval of instructor.

SOC 265. THE SOCIOLOGY OF WORK **Three credits**
An examination of varieties of work with particular emphasis on the industrial and service sectors and the professions. Included is a consideration of labor markets, occupational control, the social division of labor, and the nature of work.
Prerequisite: Soc 101 or Ant 101, or approval of instructor.

SOC 275. SOCIOLOGY OF MINORITIES **Three credits**
A theoretical analysis of inter-group tensions and processes of adjustment with special reference to modern racial, national, and religious conflicts.
Prerequisite: Soc 101 or Ant 101, or approval of instructor.

SOC 370. METHODS OF RESEARCH IN SOCIOLOGY **Three credits**
Introduction to sociological research; selected problems of research in social relations; interviewing techniques; questionnaire design and case studies.
Prerequisite: Soc 101, or approval of instructor.

SOC 380. SOCIOLOGICAL THEORY **Three credits**
The aim of the course is to provide the student majoring in sociology, or in one of the related fields, with a historical background necessary for understanding of the current trends in sociology as well as for clarification of its distinct subject matter, problems, and methods.
Prerequisite: Soc 101, or approval of instructor.

SOC 385. PRACTICUM **Six credits**
A supervised practical field experience designed for sociology majors that involves work in a professional setting.

SOC 391. SOCIAL SOUNDNESS ANALYSIS I **One credit**
Objectives, method, and design for assessing the societal impact of technological innovations and development projects. The economic, political, and cultural assumptions of project planners and social impact implications of project designs are considered. Students select specific projects for analysis and submit detailed plans for implementing their own social soundness analysis.
Prerequisite: Approval of instructor.

SOC 392. SOCIAL SOUNDNESS ANALYSIS II **Two credits**
Continuation of SOC 391. Implementing social soundness analysis under direction of instructor for projects selected in previous semester. A completed professional quality social soundness report presented and discussed in an open forum is required.
Prerequisite: Successful completion of Soc 391.

SOC 394. SOCIOLOGICAL ANALYSIS **Three credits**
The systematic critical evaluation of data by means of concepts and methods consistent with the principles of sociology. Both quantitative and qualitative procedures will be employed.
Prerequisite: Soc 101 or Ant 101, or approval of instructor.

SOC 395-396. INDEPENDENT RESEARCH **One to three credits**
Independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.
Prerequisite: By arrangement with an instructor.

SOC 397. SEMINAR **Three credits**
Presentations and discussions of selected themes and issues in sociology.
Prerequisite: Criteria will vary according to content of seminar.

SOC 399. COOPERATIVE EDUCATION **Three or six credits**
Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)
Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

SOC 198/298/398. TOPICS **Variable credit**
A study of topics of special interest not extensively treated in regularly offered courses.

The School of Liberal Arts and Human Sciences

James P. Rodechko, Ph.D.
Dean of the School

The School of Liberal Arts and Human Sciences includes eleven departments. The academic departments within the School assume responsibility for the curricula of the humanities and human sciences. All students at Wilkes will complete some course-work in these disciplines, since they provide many of the basic learning skills which enable one to write and speak effectively, to think critically, and to understand one's place in a complex and changing society. The general education or Core Curriculum, which provides a common educational experience for students preparing for a wide variety of academic as well as vocational goals, is a primary interest of the faculty within the School of Liberal Arts and Human Sciences. In addition, its departments provide programs for students preparing for careers in the health sciences, business and industry, law and government, the arts, and education.

The School of Liberal Arts and Human Sciences includes the following departments:

Art
Communications
Education
English
Foreign Languages
History
Music, Theater and Dance
Nursing
Philosophy
Physical Education
Psychology

ART

Professor Fuller, Chairperson; Professor Simon; Associate Professor Sterling; Assistant Professor Bowar; Adjunct Faculty Adams, Cohen, Stanford.

Total minimum number of credits required for a major in Art leading to the B.A. degree — 123.
(Art Education Certification requires an additional 32 credits)

Total minimum number of credits required for a major in Art leading to the B.F.A. degree — 123.
(Art Education Certification requires an additional 32 credits)

Total minimum number of credits required for a minor in Art — 18. (Above Art 101)

The B.A. curriculum requires a minimum of 41 credits in art. An interdisciplinary concentration in Art Management is also offered in the B.A. program (requiring a minimum of 35 credits in art). The B.F.A. curriculum requires a minimum of 62 credits in art, and provides more intensive study in a chosen discipline (Communication Design, Painting, Photography, Printmaking, Sculpture, or Textile Design).

Students seeking teaching certification (K-12) may pursue either degree but the B.F.A. will normally require an additional semester for completion.

Art courses required of all art majors: Art 103, 104, 105, 115, 116, 206, 220, 397, and 499.

Additional courses required in the major, by concentration:

Art (B.A.): Art 217, 221, 225, 233, one course in 243, 248, or 270, one 300-level course (3 credits);

Art Education Certification: The above except one 300-level course plus Education 101, 102, 201, 202, 203, 204, 371, 380, and Philosophy 216.

Art Management (B.A.): Art 254, 270, art history elective (3 credits), art elective (3 credits), Business Administration minor in Management (administration emphasis) or Marketing (business emphasis), Speech 101 (administration emphasis) or Business Administration 216 (business emphasis), Cooperative Education 301 (internship, 3 credits);

Communication Design (B.F.A.): Art 217, 225, 254, 255, 270, 298/398 (Design Topics, 6 credits), 490 and/or Cooperative Education 301 (6 credits), Art electives (9 credits), Communications 222;

Fine Arts (B.F.A.): Art 217, 221, 223, 225, one course in 243, 248, or 270, 300/400-level course in single discipline (12 credits); art electives (12 credits).

B.F.A. graduates will present a written analysis and photographic survey of their work for graduation.

All students seeking admission to the art major must submit a portfolio of at least 8 works (originals or slides).

Recommended Course Sequences for a Major in Art Leading to the B.F.A. Degree

First Semester

	Fine Arts B.A.	Fine Arts B.F.A	Com. Design
Art 100 Studio Skills	1	1	1
Art 103 Color & Design I	3	3	3
Art 105 Drawing & Composition	3	3	3
Eng 101 Composition I	3	3	3
Core Requirements	6	6	6
CST 101 Core Studies I	1	1	1
PE 100 Activity	0	0	0
	17	17	17

Second Semester

	Fine Arts B.A.	Fine Arts B.F.A	Com. Design
Art 104 3-D Design	3	3	3
Art 206 Color & Design II	3	3	3
Eng 102 Composition II	3	3	3
Core Requirements	6	6	6
PE 100 Activity	0	0	0
	15	15	15

Third Semester

	Fine Arts B.A.	Fine Arts B.F.A	Com. Design
Art 115 History of Art I	3	3	3
Art 220 Life Drawing	3	3	3
Art 221 Painting I	3	3	—
Art 270 Photography I	—	—	3
Core Requirements	3	3	6
Free Elective	3	3	3
	15	15	18

Fourth Semester

	Fine Arts B.A.	Fine Arts B.F.A	Com. Design
Art 116 History of Art II	3	3	3
Art 225 Printmaking I	3	3	3
Art 254 Graphic Design	—	—	3
Core Requirements	6	6	6
Free Elective	3	3	0
	15	15	15

Fifth Semester

	Fine Arts B.A.	Fine Arts B.F.A	Com. Design
Art 217 Modern Art	3	3	3
Art 233 Sculpture I	3	3	—
Art 243, 248, or 270	3	3	—
Art 255 Graphic Prod.	—	—	3
COM 322 Video Prod.	—	—	3
Core Requirement	3	3	3
Free Elective	3	3	3
	15	15	15

Sixth Semester

	Fine Arts B.A.	Fine Arts B.F.A	Com. Design
Art 300-Level Elective	3	3	3
Major Elective	—	3	3
Core Requirement	3	3	3
Free Electives	9	6	6
	15	15	15

Seventh Semester

	Fine Arts B.A.	Fine Arts B.F.A	Com. Design
Major Electives	—	9	6
Free Electives	15	6	9
	15	15	15

Eighth Semester

	Fine Arts B.A.	Fine Arts B.F.A	Com. Design
Design Topic	—	—	3
Art 490 Advanced Problems	—	9	6
Art 397 Sem: Contemp. Issues	2	2	2
Free Electives	15	6	3
	17	17	14

Recommended Course Sequences for an Art Major and Certification in Art Education

First Semester

	B.A.	B.F.A.
Art 100 Studio Skills	1	1
Art 103 Color & Design I	3	3
Art 105 Drawing & Composition	3	3
Eng 101 Composition I	3	3
Psy 101 General Psychology	3	3
Core Requirement	3	3
CST 101 Core Studies I	1	1
PE 100 Activity	0	0
	17	17

Second Semester

	B.A.	B.F.A.
Art 104 3-D Design	3	3
Art 206 Color & Design II	3	3
Eng 102 Composition II	3	3
Psychology Elective	3	3
Core Requirement	3	3
PE 100 Activity	0	0
	15	15

Third Semester

	B.A.	B.F.A.
Art 115 History of Art I	3	3
Art 220 Life Drawing	3	3
Art 221 Painting I	3	3
Ed 101 Practicum	1	1
Ed 201 Intro. to Educ.	3	3
Phl 101 Intro. to Phil.	3	3
	16	16

Fourth Semester

	B.A.	B.F.A.
Art 116 History of Art II	3	3
Art 225 Printmaking I	3	3
Ed 202 Educ. Psych.	3	3
Core Requirements	6	6
	15	15

Fifth Semester

	B.A.	B.F.A.
Art 217 Modern Art	3	3
Art 233 Sculpture I	3	3
Art 243 or 248 or 270	3	3
Phl 216 Phil. of Art	3	3
Core Requirements	3	6
	15	18

Sixth Semester

	B.A.	B.F.A.
Art 243 or 248 or 270	3	3
Art 397 Sem: Contemp. Issues	2	2
Art 300-Level Elective	—	3
Ed 102 Practicum	1	1
Ed 203 Art Methods	3	3
Core Requirements	6	3
	15	15

Seventh Semester

	B.A.	B.F.A.
Ed 204 Art Curricula	3	3
Art 300-Level Elective	3	—
Major Electives	—	6
Free Electives	9	9
	15	18

Eighth Semester

	B.A.	B.F.A.
Ed 371 Indiv. in Classroom	3	3
Ed 380 Prof. Semester	15	15
	18	18

Ninth Semester

	B.A.	B.F.A.
Art 490 Advanced Problems	—	9
Major Electives	—	6
		15

Recommended Course Sequence for a Major in Art Management

First Semester

Art 100 Studio Skills	1
Art 103 Color & Design I	3
Art 105 Drawing & Composition	3
Eng 101 Composition I	3
Ec 101 Principles of Economics I	3
Core Requirement	3
CST 101 Core Studies I	1
PE 100 Activity	0
	17

Second Semester

Art 104 3-D Design	3
Art 206 Color & Design II	3
Eng 102 Composition II	3
Ec 102 Principles of Economics II	3
Core Requirement	3
PE 100 Activity	0
	15

Third Semester

Art 115 History of Art I	3
Art 220 Life Drawing	3
BA 216 Advertising or Acc 101 Elementary Accounting I	3
Core Requirements	6
	15

Fourth Semester

Art 116 History of Art II	3
Art 254 Graphic Design	3
BA 222 Marketing or Acc 102 Elementary Accounting II	3
Core Requirement	3
Free Elective	3
	15

Fifth Semester

Art 270 Photography I	3
Art History 200-level	3
BA Elective or BA 251 Principles of Mgmt.	3
Core Requirement	3
Free Elective	3
	15

Sixth Semester

Art Elective	3
BA Elective or BA 254 Organizational Design	3
Core Requirement	3
Free Electives	6
	15

Seventh Semester

COOP 301 Internship	3
BA Elective	3
Core Requirement	3
Free Electives	6
	15

Eighth Semester

Art 397	2
BA Elective	3
Free Elective or COM 101 Speech	3
Free Electives	9
	17

ART 100. STUDIO SKILLS One credit
This course provides art students with an introduction to basic materials, tools, and techniques with which artists should be familiar, over and above those covered in specific disciplines. Students will keep a notebook suitable for future reference. One 75-minute studio class each week (primarily demonstrations). Required for all art majors, preferably in their freshman year. Offered each full semester.

ART 101. EXPERIENCING ART I Three credits
Lectures and discussion on the elements of art and the forerunners of modern and contemporary art. Two and three dimensional studio work is explored through the creative process in a variety of media.

ART 103. FUNDAMENTALS OF COLOR AND DESIGN I Three credits
A fundamentals course for all art majors involving the basic elements of design and the study of color systems including their physical, psychological, and sociological properties.

ART 104. THREE DIMENSIONAL DESIGN Three credits
An introductory course in understanding and manipulating form in three dimensions. Students will do a series of space and form projects emphasizing design and employing such materials as paper, wire, sand, plaster, clay, and wood.

ART 105. DRAWING AND COMPOSITION Three credits
An introductory course exploring the organization and potential of line, space, and texture through a variety of media and subject matter, including still life and figure drawing.

ART 115. HISTORY OF ART I Three credits
A survey of the art and architecture of Western Civilization from pre-history through the Middle Ages. Non-western cultures will also be introduced. Slide lectures and discussion will focus on major artworks and trends within their cultural setting.

ART 116. HISTORY OF ART II Three credits
A survey of the art and architecture of Western Civilization from the Renaissance to the present. Slide lectures and discussions will focus on major artists, artworks, and trends within their cultural setting.

ART 206. FUNDAMENTALS OF COLOR AND DESIGN II Three credits
An advanced approach to color and design as applied to two dimensional art, for both the fine arts student and the student wishing to apply color and design to commercial art.
Prerequisite: Art 103.

ART 217. MODERN ART AND DESIGN Three credits
20th century art and design will be considered in relation to central themes in modern civilization, such as science and technology, social and political revolution, historicism, and formalism. Slide lectures and discussions will treat objects as diverse as paintings and refrigerators, buildings and billboards.

ART 220. LIFE DRAWING Three credits
Advanced study and research for art majors in the development of drawing skills using the live model.
Prerequisite: Art 105 or permission of instructor.

ART 221. PAINTING I Three credits
An introduction to painting methods, techniques, and materials. Emphasis on the organization of composition and painting techniques.

ART 225. PRINTMAKING I Three credits
An introduction of relief, intaglio, and planographic techniques including block printing, etching, lithography, and silk screen.

ART 228. WATER COLOR PAINTING Three credits
An exploration into painting methods of transparent and opaque paints involving still life, landscape, and a wide range of other subject matter.

ART 233. SCULPTURE I Three credits
An introductory course into the basic concepts of three dimensional form and space. Modeling in clay from life; casting and direct building techniques in plaster; basic carving experiences in stone and wood. Fee: $15.

ART 243. CERAMICS I Three credits
Exploration into the basic methods and techniques of hand building and wheel work. Experimentation in surfaces decoration, glazing, and kiln firing. Fee: $25.

ART 245. SURFACE DESIGN I Three credits
An exploration of both traditional and contemporary methods of the fabric enhancement, with emphasis upon Batik. Fee: $15.

ART 248. FIBER I Three credits
An introduction to the techniques and aesthetic uses of fiber in its single element and basic weaving processes.

ART 254. GRAPHIC DESIGN I Three credits
Familiarization with the tools, design elements, and production processes of the graphic artist. The value and contribution of the graphic arts to society will be discussed. Students will experience methods and techniques currently being practiced in the graphic design field.

ART 255. GRAPHIC ARTS PRODUCTION Three credits
An overview of the graphic arts industry emphasizing production procedures from the mechanical stage to the printed piece. Attention will be given to typography, typesetting, printing processes, paste-up, printing papers, binding and finishing. Visits to printers and publishers will be included.

ART 270. PHOTOGRAPHY I Three credits
An introduction to the fundamentals of photography; camera usage, subject consideration, lighting, darkroom techniques, and the preparation of photographs for exhibit. Fee: $20.

ART 325. PAINTING II Three credits
Increased emphasis on development of style and experimentation in contemporary art methods and techniques.
Prerequisite: Art 221.

ART 328. PRINTMAKING II Three credits
Individual experimentation using plastics, photographic techniques in silk screen, lithography, and intaglio, as well as traditional methods.
Prerequisite: Art 225.

ART 333. SCULPTURE II Three credits
An exploration into metal sculpture employing gas and electric welding processes; plastics. Advanced work in carving, construction, and assemblage in various media. Fee: $15.
Prerequisite: Art 233 or permission of instructor.

ART 344. CERAMICS II — Three credits
Advanced work in both hand-built and wheel-thrown ceramics. Fee: $25.
Prerequisite: Art 243.

ART 348. FIBER II — Three credits
Advanced study of weaving processes using a variety of loom structures.
Prerequisite: Art 248.

ART 370. PHOTOGRAPHY II — Three credits
Advanced work in black and white photography, including the zone system; refined darkroom techniques and development of a personal style. Fee: $20.
Prerequisite: Art 270.

ART 395-396. INDEPENDENT RESEARCH — One to three credits
Independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.
Prerequisite: Approval of department chairperson is required.

ART 397. SEMINAR: CONTEMPORARY ISSUES — Two credits
Ideas and problems in contemporary art and criticism will be discussed, using current literature and exhibitions.
Prerequisite: Junior or senior standing.

ART 399. COOPERATIVE EDUCATION — Three or six credits
Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)
Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

ART 198/298/398. TOPICS — Variable credit
A study of topics of special interest not extensively treated in regularly offered courses. Recent studio topics have included Ceramic Sculpture, Color Photography, and Lettering. Recent art history topics have included Italian Renaissance Art and Modern Architecture.

ART 490. ADVANCED PROBLEMS IN STUDIO — One to six credits
Independent work in a selected studio discipline for the advanced student. Periodic consultation with the instructor will be arranged. May be repeated for a maximum of 15 credits in any one discipline. Open only to junior and senior B.F.A. candidates. Fee: variable.
Prerequisite: Appropriate 300-level course.

ART 499. SENIOR EXHIBITION — No credit
Every senior will prepare an exhibition of his or her work, in consultation with the student's faculty advisor. The exhibition may be presented either in the fall or spring term.

COMMUNICATIONS

Associate Professor Kinney, Chairperson; Professors Bigler, Moran; Assistant Professors Elmes-Crahall, Incitti; Engineer, Brigido.

Total minimum number of credits required for a major in Communications leading to the B.A. degree — 121.
Total minimum number of credits required for a minor — 18.

The Department of Communications has concentrations in Rhetoric and Public Communication; Interpersonal and Organizational Communication; Telecommunications (Broadcasting); and Journalism. Each concentration offers a wide choice of career options as well as graduate school preparation. While each concentration has its own unique curricular aspects, the goals are the same — a graduate who is able to write, speak, and think both analytically and creatively. While the program is not highly specialized, there are enough skills and performance courses and co-curricular activities that our graduates will be able to apply their abilities to every-day situations. In addition, the theory, writing and analysis courses should enable students to advance beyond the entry level in their chosen fields or even to change fields entirely. We believe the curriculum also affords ample opportunity for the student to explore other disciplines.

The Major

Departmental Requirements:

All students choosing to major in Communications must fulfill specific departmental requirements. These courses contain skills, theory, analysis, performance, writing, and research. They are as follows:

COM 100 Modes of Expression
COM 101 Fundamentals of Public Speaking
COM 102 Principles of Communication
COM 397 Senior Seminar

The Department also has a six-hour writing requirement for all communication majors.

Concentration Requirements:

Each concentration is described and outlined on the following pages.

Interpersonal and Organizational Communication

This concentration introduces students to the theory, skills, and application of face-to-face communication in interpersonal, small group, organizational, and public settings. Its theoretical foundation is primarily in the behavioral sciences. Communication is viewed as an ongoing process, knowledge of which permits the student to apply his or her skills to a variety of contexts.

All students concentrating in Interpersonal and Organizational Communication will choose five courses (15 credits) from the following:

COM 202 Interpersonal Communication
COM 203 Small Group Communication
COM 206 Business and Professional Speaking
COM 252 Internship
(Only three credits of internship may count in the concentration.)
COM 301 Persuasion
COM 302 Public Relations
COM 303 Organizational Communication

Writing Requirement (6 credits):

COM 260 Basic Newswriting and either
Eng 201 Advanced Composition or
Eng 202 Technical Writing

Public Relations Track:

The Public Relations Society of America has developed guidelines for undergraduates wishing to enter the field of public relations. Students should consult an advisor within the department to determine what additional courses will be necessary to meet these guidelines.

Rhetoric and Public Communication

This concentration introduces students to the history, principles, and practices of traditional rhetoric. The concentration derives it theoretical foundation from the works of classical rhetoric. It is a performance-centered concentration in which students research, write, deliver, and analyze public discourse. Each course emphasizes adaptation of messages to diverse audiences, usually found in formal, deliberative settings.

All students concentrating in Rhetoric and Public Communication will choose five courses (15 credits) from the following:

COM 201 Advanced Public Speaking
COM 203 Small Group Communication
COM 204 Argumentation and Debate
COM 206 Business and Professional Speaking
COM 252 Internship
(Only three hours of internship may count in the concentration.)
COM 300 Rhetorical Criticism
COM 301 Persuasion
COM 302 Public Relations

Writing Requirement (6 credits):

Eng 201 Advanced Composition and
COM 260 Basic Newswriting or
COM 225 Media Criticism

Political Communication Track:

Students who are interested in careers in political communication must satisfy the fifteen-credit concentration requirement, and take three political science courses at the 200 level or above. These courses should be chosen in consultation with an advisor.

Recommended Course Sequences for Interpersonal and Organizational Communication and Rhetorical and Public Communication Concentrations

First Semester		Second Semester	
Eng 101 Composition I	3	Eng 102 Composition II	3
COM 100 Modes of Expression	3	COM 102 Principles of Communication	3
COM 101 Fundamentals of Speech	3	Core Requirements	9
Core Requirements	6	PE 100 Activity	0
CST 101 Core Studies I	1		15
PE 100 Activity	0		
	16		

Third Semester		Fourth Semester	
Concentration Selection	3	Concentration Selections	6
Writing Requirement	3	Writing Requirement	3
Core Requirements	9	Core Requirements	6
	15		15

Fifth Semester		Sixth Semester	
Concentration Selection	3	Concentration Selection	3
Core Requirements	6	Internship (See Advisor)	3
Major Elective	3	Core Requirement (If necessary)	3
Free Elective	3	Free Electives	6
	15		15

Seventh Semester		Eighth Semester	
Internship (See Advisor)	3	COM 324 Communication Research Methods	3
Concentration Selection	3	COM 397 Senior Seminar	3
Major Elective	3	Free Electives	9
Free Electives	6		15
	15		

Telecommunications

This concentration introduces students to the history, economics, regulations, and functions of the radio, television and cable industries. It provides students with a combination of skills, performance, and theory that will enable graduates to seek employment in those industries. In addition, students should be competitive in advertising, marketing, and research firms as well as audio/video media.

All students concentrating in Telecommunications must take the following course:

COM 220 Introduction to Telecommunications

All students concentrating in Telecommunications will then choose five courses (15 credits) from the following:

COM 221 Basic Audio Production
COM 222 Basic Video Production
COM 223 The Art of Film
COM 224 Mass Media
COM 252 Internship
(Only three credits of internship may count in the concentration.)
COM 321 Broadcast Journalism
COM 322 Advanced Video Production
COM 362 Mass Communications Law

Writing Requirement (6 credits):

COM 225 Media Criticism or
COM 260 Basic Newswriting and
Eng 201 Advanced Composition

Recommended Course Sequence for Telecommunications Concentration

First Semester		Second Semester	
Eng 101 Composition I	3	Eng 102 Composition II	3
COM 100 Modes of Expression	3	COM 220 Intro. to Telecommunications	3
COM 101 Fundamentals of Speech	3	Core Requirements	9
Core Requirements	6	PE 100 Activity	0
CST 101 Core Studies I	1		15
PE 100 Activity	0		
	16		

Third Semester		Fourth Semester	
COM 102 Principles of Communications	3	Concentration Selections	6
Concentration Selection	3	Writing Requirement	3
Writing Requirement	3	Core Requirements	6
Core Requirements	6		15
	15		

Fifth Semester		Sixth Semester	
Concentration Selection	3	Concentration Selection	3
Core Requirements	6	Internship (See Advisor)	3
Major Elective	3	Core Requirement (If necessary)	3
Free Elective	3	Free Electives	6
	15		15

Seventh Semester		Eighth Semester	
Internship (See Advisor)	3	COM 324 Comm. Research Methods	3
Concentration Selection	3	COM 397 Senior Seminar	3
Major Elective	3	Free Electives	9
Free Electives	6		
	15		15

Journalism

This concentration is designed to prepare students to write crisp, concise, lively prose for mass audiences; to utilize, interpret, and analyze primary sources; and to offer thought-provoking commentary on contemporary issues and current events. Students are strongly advised to pursue a minor in English, Political Science, History or another area, with departmental approval.

All students concentrating in Journalism will choose five courses (15 credits) from the following:

COM 224 Mass Media
COM 254 Publication Design
COM 260 Basic Newswriting (may not be used to fulfill concentration requirement if already used to fulfill writing requirement)
COM 261 The American Newspaper
COM 360 Editing and Advanced Newswriting
COM 361 Feature Writing
COM 362 Mass Communications Law

Writing Requirement (6 credits):

COM 260 Basic Newswriting
Eng 201 Advanced Composition

Recommended Course Sequence for Journalism Concentration

First Semester		Second Semester	
Eng 101 Composition I	3	Eng 102 Composition II	3
COM 100 Modes of Expression	3	COM 102 Principles of Communication	3
COM 101 Fundamentals of Speech	3	Core Requirements	9
Core Requirements	6	PE 100 Activity	0
CST 101 Core Studies I	1		15
PE 100 Activity	0		
	16		

Third Semester	
Concentration Selection	3
Writing Requirement	3
Core Requirements	9
	15

Fourth Semester	
Concentration Selections	6
Writing Requirement	3
Core Requirements	6
	15

Fifth Semester	
Concentration Selection	3
Core Requirements	6
Major Elective	3
Free Elective	3
	15

Sixth Semester	
Concentration Selection	3
Internship (See Advisor)	3
Core Requirement (If necessary)	3
Free Electives	6
	15

Seventh Semester	
Internship (See Advisor)	3
Concentration Selection	3
Major Elective	3
Free Electives	6
	15

Eighth Semester	
COM 324 Comm. Research Methods	3
COM 397 Senior Seminar	3
Free Electives	9
	15

The Minor

Minors are offered in each of the areas of concentration provided by the Department. Minor requirements are as follows:

1. **Interpersonal and Organizational Communication Minor**

   Required: Either COM 101 Fundamentals of Speech or COM 102 Principles of Communication

   Electives: Five of the following:

   COM 202 Interpersonal Communication
   COM 203 Small Group Communication
   COM 206 Business and Professional Speaking
   COM 301 Persuasion
   COM 302 Public Relations
   COM 303 Organizational Communication

2. **Rhetoric and Public Communication Minor**

   Required: Either COM 101 Fundamentals of Speech or COM 102 Principles of Communication

   Electives: Five of the following:

   COM 201 Advanced Public Speaking
   COM 203 Small Group Communication
   COM 204 Argumentation and Debate
   COM 206 Business and Professional Speaking
   COM 300 Rhetorical Criticism
   COM 301 Persuasion
   COM 302 Public Relations

3. **Telecommunications Minor**

   Required: COM 220 Intro. to Telecommunications

   Electives: Five of the following:

   COM 221 Basic Audio Production
   COM 222 Basic Video Production
   COM 223 The Art of Film
   COM 224 Mass Media
   COM 321 Broadcast Journalism
   COM 322 Advanced Video Production
   COM 362 Mass Communications Law

4. **Journalism Minor**

   Required: COM 260 Basic Newswriting

   Electives: Five of the following:

   COM 224 Mass Media
   COM 254 Publication Design
   COM 261 The American Newspaper
   COM 360 Editing and Advanced Newswriting
   COM 361 Feature Writing
   COM 362 Mass Communications Law

COM 100. MODES OF EXPRESSION **Three credits**

An introduction to the methodologies of speech, communications, and theater through an examination of interdisciplinary treatment of a particular topic or issue. Team taught by members of the department. Topic changes yearly. Required of all department majors, course should be taken freshman year. Offered every fall semester.

COM 101. FUNDAMENTALS OF PUBLIC SPEAKING **Three credits**

Principles of study, application, and evaluation of public speaking. Emphasis will be upon meeting the needs of students through individualized instruction in oral communication settings. The course is taught each semester. (Formerly Speech 101)

COM 102. PRINCIPLES OF COMMUNICATION **Three credits**

A study of the theory and process of communication. Required of all department majors. Taught every spring semester. (Formerly Communication 101)

COM 144. DEPARTMENT PRACTICUM **One to two credits**

A - Debate and Forensics, C – WCLH Radio, D – The *Beacon*, E – Yearbook, F – Television, G - Department.

The Department Practicum may be taken for one to two credits per semester with the total not to exceed six. Students may earn credit for major roles and positions of major responsibility in the above cocurricular activities. Credit for participation in these activities is optional, and voluntary participation (without credit) is also encouraged. The department, through the adviser or instructor of the activity, has the authority to approve or reject any contract for credit under this designation. Credits earned are applicable toward graduation but do not count toward the requirements of any concentration in COM. Approval of credit must be by advisor and Department Chairperson.

COM 201. ADVANCED PUBLIC SPEAKING **Three credits**

Inquiry into the practice and principles of speech composition and presentation. Detailed analysis of the areas of invention, arrangement, style, and delivery, and an introduction to speech criticism. (Formerly Speech 201)

Prerequisite: COM 101 or consent of instructor. Course taught spring semester, every other year.

COM 202. INTERPERSONAL COMMUNICATION **Three credits**
The course focuses on interpersonal communication theory and its application to improving the student's interpersonal skills in managing conflict, negotiating, listening, interviewing, and the development of relationships. (Formerly Communication 201)
Prerequisite: COM 102. Course taught every fall semester.

COM 203. SMALL GROUP COMMUNICATION **Three credits**
The course is designed to expand the student's knowledge of the theories and types of small group communication. Emphasis on the task, leadership, and interpersonal skills of participants. Course taught spring semester, every other year. (Formerly Communication 202)
Prerequisite: COM 102.

COM 204. ARGUMENTATION AND DEBATE **Three credits**
Training in the fundamentals of argumentation and debate, with practice in gathering and organizing evidence and support materials. Course taught every other fall semester. (Formerly Speech 205)
Prerequisite: COM 101 or consent of instructor.

COM 205. ORAL INTERPRETATION **Three credits**
An investigation of literature that combines analysis with interpretive oral performance. Spring semester, every third year. (Formerly Speech 206)

COM 206. BUSINESS AND PROFESSIONAL SPEAKING **Three credits**
Course will concentrate on communication theory as applied to business and professional settings. Students will make several oral presentations and participate in interviewing and conferences. Course taught fall semester, every other year. (Formerly Speech 202)

COM 207. VOICE AND DICTION **Three credits**
A study of voice production and articulation, analysis of regional speech differences and standards.
Prerequisite: COM 101.

COM 220. INTRODUCTION TO TELECOMMUNICATIONS **Three credits**
Study of the radio, television, and cable industries. Emphasis on their development as public and commercial institutions. Consideration of economic and regulatory issues affecting programming. (Parts of the course were formerly contained in Communication 240 and Communication 245)
Prerequisite: COM 100 and COM 102. Taught every spring semester.

COM 221. AUDIO PRODUCTION **Three credits**
A study of the principles and techniques of audio production. A special emphasis is placed on radio-related issues, skills, and projects. Consideration of the sound media as tools of artistic expression. Lecture and laboratory. (Parts of this course were formerly contained in Communication 240)
Prerequisite: COM 220. Taught every second fall semester.

COM 222. BROADCAST PRODUCTION **Three credits**
A study of the principles and techniques of TV Studio Production. A special emphasis is placed on the utilization of these techniques in a broadcast setting. Included will be: Camerawork, Switching, Studio Equipment, Set Design, Directing and Producing. Fee: $20. (Formerly Communication 246)

COM 223. THE ART OF FILM **Three credits**
An introduction to the history, aesthetics, and techniques of cinematic art through a study of representative films by Bergman, Chaplin, Eisenstein, Griffith, Hitchcock, Welles, and others. Screenings.

COM 224. MASS MEDIA **Three credits**
A study of the mass media and their role in contemporary society. Course taught every other fall semester. (Formerly Communication 205)
Prerequisite: COM 100 and COM 102.

COM 225. MEDIA CRITICISM **Three credits**
Students analyze and evaluate all forms of mass media content — visual and verbal. Written analysis of primary texts: plays, scripts, essays, short stories, newspaper, and magazine articles, as well as radio and television programming, speeches, and films. Critical principles will be applied.

COM 252. INTERNSHIP **Three to six credits**
A supervised program of work and study in any of the concentrations. Permission of the department is required.

COM 254. PUBLICATION DESIGN **Three credits**
Familiarization with the tools, design elements, and production processes of the graphic artist. The value and contribution of the graphic arts to society will be discussed. Students will experience methods and techniques currently being practiced in the graphic design field. It is suggested that students without an art background take Art 103 prior to this course. (Same as Art 254)

COM 260. BASIC NEWSWRITING **Three credits**
Fundamentals of newsgathering, newswriting, and news judgment for all media; study of news sources; fieldwork, research, and interview techniques. Fee: $20. (Formerly Communication 211)
Prerequisite: Eng 101-102 and COM 100. Offered every fall semester.

COM 261. THE AMERICAN NEWSPAPER **Three credits**
A survey of contemporary newspapers emphasizing the analysis of their editorial content. Includes an examination of alternative newspapers.
Prerequisite: COM 100 and COM 102. Offered every other spring semester.

COM 300. RHETORICAL CRITICISM **Three credits**
Theories from classical to contemporary will be applied to the analysis of the spoken word. Emphasis on speech writing and criticism. (Formerly Speech 301)
Prerequisite: COM 101. Spring semesters, odd-numbered years.

COM 301. PERSUASION **Three credits**
Study and practice of persuasive speaking. General theories of persuasion, the role of persuasion in a democratic society, and an introduction to modern experimental research in the field. (Formerly Speech 302)
Prerequisite: COM 101. Fall semesters, odd-numbered years.

COM 302. PUBLIC RELATIONS **Three credits**
An introduction to the fundamentals of public relations practice, including program planning and evaluation, working with the media, writing for PR, and coordinating special events and functions. (Formerly Communication 215)
Prerequisite: COM 202 and COM 260. Fall semesters.

COM 303. ORGANIZATIONAL COMMUNICATION **Three credits**
Course focuses attention on traditional and modern concepts of communication channels in simple and complex organizations. Considerable attention is given to interviewing and conducting communication audits.
Prerequisite: COM 202. Spring semesters, even-numbered years.

COM 321. BROADCAST JOURNALISM — **Three credits**

A study of the principles and methods of broadcast journalism. (Formerly Communication 241)

Prerequisite: COM 100. Course taught every other spring semester.

COM 322. VIDEO PRODUCTION — **Three credits**

A study of the principles and techniques of video production. Scripting, producing, and editing videography are subjects covered extensively by this course. Each student will produce several video productions.

Prerequisite: COM 222. Course taught every other spring semester.

COM 324. COMMUNICATION RESEARCH METHODS — **Three credits**

Study of research methods in various areas of communication. Emphasis on ability to research literature and critique a research design. Consideration of content analysis and empirical design.

Prerequisite: COM 100 and 102, completion of departmental writing requirement, and junior/senior standing.

COM 360. JOURNALISM: EDITING AND ADVANCED NEWSWRITING — **Three credits**

A study of specialized reporting and an introduction to news editing.

Prerequisite: COM 260.

COM 361. FEATURE WRITING — **Three credits**

A study of feature articles for newspapers, syndicates, magazines, and specialized publications. Practice in research, interviewing, and writing.

Prerequisite: COM 160.

COM 362. MASS COMMUNICATION LAW — **Three credits**

Current legal problems, theory of controls in journalism, television, and radio; libel, copyright, privacy law, and other legal issues affecting the mass media. A case study approach will be used.

Prerequisite: COM 100 and 102.

COM 395-396. INDEPENDENT RESEARCH — **One to three credits**

Independent study and research for advanced students in the speech and communication programs under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.

COM 397. SENIOR SEMINAR/COMMUNICATIONS — **Three credits**

An in-depth investigation of current research and issues in communication. Research paper required. Open to all COM majors. (Formerly Communication 397)

Prerequisite: Junior/Senior standing.

COM 398. TOPICS — **One to three credits**

A study of topics of special interest not extensively treated in regularly offered courses.

COM 399. COOPERATIVE EDUCATION — **Three or six credits**

Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)

Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

EDUCATION

Professor Heikkinen, Chairperson; Assistant Professor Williams, Director of Teacher Extension Programs; Professors Emeriti Darte, Hammer; Professors Fahmy, Placek; Associate Professors Johnson, Lynch; Assistant Professors Chase, Ginsburgh, G. Meyers, Polachek.

The Education Department offers programs leading to teacher certification in art, biology, chemistry, communications, early childhood, earth and space science, elementary education, English, French, German, mathematics, music, physics, social studies, and Spanish. Copies of curricula for these programs are available in the appropriate department and in the Education Department office.

The teacher education program at Wilkes requires students to major in a discipline other than education. Individuals who want teacher certification in elementary education must major in one of the following: Art, Biology, Chemistry, Computer Science, Earth and Environmental Science, Economics, English, Foreign Languages, History, Interpersonal and Organizational Communication, Journalism, Mathematics, Philosophy, Physics, Political Science, Psychology, Theater Arts, Sociology, or Telecommunications.

Secondary school teaching certification candidates must take Ed 101, 102, 201, 202, 203 (and/or appropriate special methods courses), 371, and 380. They must also major in one of the following: Art, Biology, Chemistry, Earth and Environmental Sciences, English, Foreign Languages, Mathematics, Physics, Communications or Social Studies. (Note that Wilkes certifies teachers to teach Social Studies, **not** the individual disciplines of History, Political Science, Psychology, Sociology, and/or Economics.)

Social studies certification candidates who major in history must take twelve credits beyond the introductory sequence in one of the social sciences (anthropology, economics, political science, psychology, or sociology). Those who do not major in history must take twelve credits in history beyond 101-102. All candidates must include the following courses in their program: Ant 101, Ec 101 and 227 or 228, Hst 207 and 208, PS 102, and Soc 101.

Elementary school teaching certification candidates must take the following courses, several of which may be incorporated in the core and major: Mth 103, 104, 232, 243; Psy 221; Bio 105; EES 130; and Ed 101, 102, 201, 202, 301, 302, 321, 322, 323, 324, 371, and 380.

Early childhood teaching candidates complete the elementary school teaching program described above and take Ed 361 and 362.

Teaching candidates in art or music will find their programs described on page 112 (art) or page 156 (music).

Students interested in preparing for teacher certification must have a cumulative G.P.A. of 2.3, recommendation by the major department, recommendation of the Dean of Student Affairs, and recommendation by the Teacher Education Committee. Criteria for admission to student teaching

are established by the Teacher Education Committee; and applications are submitted to the Committee for approval.

Interested students are encouraged to seek advice in the Education Department early in their first semester at the University.

Recommended Course Sequence for Certification in Elementary Education

First Semester		Second Semester	
Eng 101 Composition I	3	Eng 102 Composition II	3
Psy 101 General Psychology	3	Psy 221 Developmental Psychology	3
Mth 103 Math for Elementary School Teachers I	3	Mth 104 Math for Elementary School Teachers II	3
Core Electives	6	Core Electives	6
PE 100 Activity	0	Major Elective	3
CST 101 Core Studies I	1	PE 100 Activity	0
	16		18
Third Semester		**Fourth Semester**	
Ed 101 Practicum	1	Ed 102 Practicum	1
Ed 201 Intro. to Education	3	Ed 202 Educational Psychology	3
Elementary Education Requirements*	2-3	Elementary Education Requirements*	2-3
Mth 232 Abstract Algebra for Elementary School Teachers	3	Mth 243 Geometry for Elementary School Teachers	3
Core Elective	3	Core Elective	3
Hst 207 American History	3	Hst 208 American History	3
	15-16		15-16
Fifth Semester		**Sixth Semester**	
Bio 105 Human Biology	3	EES 130 Environmental Awareness	3
Elementary Education Requirements*	4-6	Elementary Education Requirements*	4-6
Core Elective	3	Core Elective	3
Major Electives	6	Major Electives	6
	16-18		16-18
Seventh Semester		**Eighth Semester**	
Core Elective	3	Ed 371 Student Teaching Seminar	3
Major Electives	15	Ed 380 Professional Semester	15
	18		18

*Elementary Education Requirements:

Ed 301 Health, Physical Education, Safety in Early Childhood and Elementary Education	2 cr
Ed 302 Children's Literature	2 cr
Ed 321 The Teaching of Reading	3 cr
Ed 322 Language Arts and Social Studies in Early Childhood and Elementary Education	3 cr
Ed 323 Mathematics and Science in Early Childhood and Elementary Education	3 cr
Ed 324 The Arts in Early Childhood and Elementary Education	2 cr

Recommended Course Sequence for Certification in Secondary Education

First Semester		Second Semester	
Eng 101 Composition I	3	Eng 102 Composition II	3
Psy 101 General Psychology	3	Psy 221 Developmental Psychology	3
Core Requirements	5-7	Core Requirements	6-8
Major Electives	3-4	Major Electives	3-4
CST 101 Core Studies I	1	PE 100 Activity	0
PE 100 Activity	0		
	16-18		15-18
Third Semester		**Fourth Semester**	
Ed 101 Practicum	1	Ed 102 Practicum	1
Ed 201 Intro. to Education	3	Ed 202 Educational Psychology	3
Core Requirements	9-10	Core Requirements	9-10
Major Elective	3	Major Elective	3
	16-17		16-17
Fifth Semester		**Sixth Semester**	
Core Requirement	3	Core Requirement	3
Major Electives	6-9	Major Electives	6-9
Free Electives	6	Free Electives	6
	15-18		15-18
Seventh Semester		**Eighth Semester**	
Core Requirement	3	Ed 371 The Individual in the Classroom	3
Major Electives	6-9	Ed 380 Professional Semester	15
Free Electives	6		18
	15-18		

ED 101-102-103. PRACTICUM IN EDUCATION **One credit each**

Provides an opportunity for students to gain experience as teachers' aides in school classrooms under supervision. Seminars on campus will provide opportunity to discuss and evaluate practicum experiences. Ed 101 must be taken in conjunction with Ed 201. Ed 102 must be taken in conjunction with Ed 203 or Ed 322.

ED 150. LIFE CAREER PLANNING **Three credits**

An exploration of the effect of societal norms, historical forces, economic conditions, and psychological factors upon individual career choices.

ED 201. INTRODUCTION TO EDUCATION **Three credits**

A study of the historical development of American education, the role of the school in American life, educational philosophies, educational organization and administration, school finance, school curricula, school personnel, and current issues in education.

Prerequisite: Sophomore standing.

ED 202. EDUCATIONAL PSYCHOLOGY **Three credits**
A study of the principles of learning and the application of psychological principles in the practice of education.
Prerequisite: Psy 101.

ED 203. SPECIAL METHODS OF TEACHING **Three credits**
A study of instructional methodology in the various disciplines. Attention is given to characteristic problems faced by teachers in these several fields. Reading and other specialized techniques are examined.

Section A — Art (Grades K-12)
Section C — Communication/English (Grades 7-12)
Section F — Foreign Languages (Grades K-12)
Section G — Mathematics (Grades 7-12)
Section H — Music (Grades K-12)
Section I — Sciences (Grades 7-12)
Section J — Social Studies (Grades 7-12)

ED 204. BASIC EDUCATION CURRICULA **Three credits**
An examination of curricula in the various disciplines. Programs of study developed by various organizations are examined.

Section A — Art (Grades K-12)
Section C — Communication/English (Grades 7-12)
Section F — Foreign Languages (Grades K-12)
Section G — Mathematics (Grades 7-12)
Section H — Music (Grades K-12)
Section I — Sciences (Grades 7-12)
Section J — Social Studies (Grades 7-12)

ED 290. ANALYSIS OF RESEARCH **Three credits**
This course provides instruction designed to help students learn how to locate and evaluate factual information; research procedures are examined; research reports are analyzed; students identify and criticize reports in their field of study.

ED 301. HEALTH, PHYSICAL EDUCATION AND SAFETY IN EARLY CHILDHOOD AND ELEMENTARY EDUCATION **Two credits**
This is a study of the methods and materials appropriate for teaching health, physical education and safety. Emphasis is on understanding the developmental levels, needs and interests of children in these areas from infancy to early adolescence.

ED 302. CHILDREN'S LITERATURE **Two credits**
This course examines the role of literature in the lives of children from infancy through early adolescence. Emphasis is on criteria for selecting literature for the classroom and suggestions for presenting literary works and basic literary concepts in various educational settings.

ED 321. THE TEACHING OF READING **Three credits**
This course is an introduction to the elementary school reading program. The course bridges the gap between theory and practice; it focuses on relevant research and the principles, issues, instructional strategies and materials involved in teaching reading to students in the elementary school.

ED 322. LANGUAGE ARTS AND SOCIAL STUDIES IN EARLY CHILDHOOD AND ELEMENTARY EDUCATION **Three credits**
The purpose of this course is to inform and actively involve learners in studying a myriad of concepts and varied methodologies for language arts and social studies education at the elementary school level. The course focuses on a broad interpretation and integration of the language arts and social studies, and endorses a multidisciplinary approach to teaching and learning.

ED 323. MATHEMATICS AND SCIENCE IN EARLY CHILDHOOD AND ELEMENTARY EDUCATION **Three credits**
This course is designed to present a study of the research, concepts, and methodologies pertinent to the teaching of mathematics and science at the early childhood and elementary school levels. Emphasis is placed on 1) the use of concrete manipulatives and hands-on materials to facilitate the learning process, 2) the knowledge necessary to guide children to become mathematically and scientifically literate, and 3) the implementation of planning and instructional techniques to mathematics and science teaching.

ED 324. THE ARTS IN EARLY CHILDHOOD AND ELEMENTARY EDUCATION **Two credits**
An exploration of common situations in elementary education to discover the opportunities for creative work and the methods and materials by which they may be realized. An extension of personal experience with a variety of arts and crafts materials and processes used by children.

ED 325. METHODS AND MATERIALS OF INSTRUCTIONAL TECHNIQUES FOR EXCEPTIONAL CHILDREN **Three credits**
Examination of instructional materials for use with exceptional children and study of instructional techniques for providing effective educational experiences.

ED 351. EDUCATIONAL MEASUREMENTS **Three credits**
A study of the characteristics, construction, and use of various educational measuring instruments commonly available in schools.
Prerequisite: Ed 202.

ED 352. GUIDANCE **Three credits**
An introduction to general principles and the techniques employed in guidance programs in public schools.
Prerequisite: Ed 202.

ED 361. EARLY CHILDHOOD EDUCATION **Three credits**
This course enables the student to understand the purpose for and operation of nursery schools, child care centers, and other pre-school institutions.

ED 362. INSTRUCTION IN EARLY CHILDHOOD EDUCATION **Three credits**
This course prepares the student to work in a nursery school, child care center, or other pre-school institution.

ED 370. SPECIAL PROJECTS **Three credits**

ED 371. STUDENT TEACHING SEMINAR **Three credits**
This course is designed to prepare student teachers at the elementary and secondary levels to gain an understanding of the knowledge that will help them to interact more effectively as professionals both in and beyond the classroom situation. Emphasis is placed on 1) current research regarding effective teaching and learning, including multiethnicity and special needs of exceptional children, 2) controversial educational issues, and 3) development of each student's educational philosophy, professional profile, and interviewing skills.

ED 380. PROFESSIONAL SEMESTER IN EDUCATION **Fifteen credits**
This course examines professional problems common to all teachers and provides practical experience in classroom teaching. Fee: $50.
Prerequisite: Approval by the Teacher Education Committee.

Credit will be transcripted as follows:

ED 381. PROFESSIONAL PRACTICUM **Four credits**
A 4-week seminar on pre-student teaching skills.

ED 382. INTERN TEACHING **Eleven credits**
A 12-week on-the-job student teaching experience.

ED 395-396. INDEPENDENT RESEARCH **One to three credits**
Independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.
Prerequisite: Approval of department chairman is required.

ED 397. SEMINAR **(Maximum of three credits per student) One to three credits**
Presentations and discussions of selected topics.
Prerequisite: Approval of department chairman is required.

ED 198/298/398. TOPICS IN EDUCATION **Variable credit**
A study of topics of special interest not extensively treated in regularly offered courses.



ENGLISH

Associate Professor P. Heaman, Chairperson; Professors Emeriti Lord, Rizzo; Professors Fiester, Gutin, Kaska, Terry; Associate Professor R. Heaman; Assistant Professors Ballentine, Bedford, Bloom, Jordan, Kemmerer, Kuhar.

Total minimum number of credits required for a major in English leading to the B.A. degree — 121.
Total minimum number of credits required for a minor — 18.

Wilkes University requires 121 credit hours for a B.A. degree in English. These include 46 credit hours in core courses and 39 credit hours in English.

The English major offers students an opportunity to develop language and writing skills, to practice creative and critical thinking, and to establish a foundation of liberal learning through the study of literature. The skills, values, and habits of thought acquired through the study of language and literature prepare students for careers in teaching, law, communications, journalism, business, government service, and other professional areas. A second major or a minor in English adds an attractive dimension to a student's major preparation in communications, business, theater, pre-law, and other pre-professional and technical programs in which effective writing, liberal learning, and critical thinking are valued.

Students who major in English are required to take Eng 101 and 102 in their freshman year, and Eng 151, 253, and 254 in their sophomore year.

Concentrations

Students who concentrate in literature are required to take 24 credit hours in literature courses numbered above 300, including one course in a major writer, one course in fiction or drama, one course in American literature, two period courses in English literature before 1900, and one seminar.

Students who concentrate in writing are required to take twelve credit hours in advanced literature courses, Eng 201, and an additional nine credit hours in other writing courses numbered 200 and above. Students in the writing concentration must submit a portfolio of written work in the senior year.

Honors

Qualified students who concentrate in literature may participate in an honors program, which may lead to graduation with distinction in English. The program consists of a planned series of seminars and independent research in the junior and senior years, culminating in a thesis and a comprehensive examination.

Minor

Students who choose to minor in English are required to take Eng 151 and 152 and an additional twelve credits in courses numbered 200 and above.

Certification

Students seeking certification as secondary public school teachers in English mush take Eng 201, 220, 225, 305, 306, 397, one course in a major author, one course in American literature, and one course in fiction or drama.

Recommended Course Sequence for a Major in English

First Semester		Second Semester	
Eng 101 Composition I	3	Eng 102 Composition II	3
Core Requirements	12	Core Requirements	12
CST 101 Core Studies I	1	PE 100 Activity	0
PE 100 Activity	0		15
	16		

Third Semester		Fourth Semester	
Eng 151 Western World Literature	3	Eng 254 Survey of English Literature II	3
Eng 253 Survey of English Literature I	3	Major Elective	3
Core Requirements	9	Core Requirements	9
	15		15

Fifth Semester		Sixth Semester	
Major Electives*	9	Major Electives*	9
Free Electives	6	Free Electives	6
	15		15

Seventh Semester		Eighth Semester	
Eng 397	3	Major Elective*	3
Free Electives	12	Free Electives	12
	15		15

*Students select major electives to meet requirements in their area of concentration.

Recommended Course Sequence for Teacher Certification in English

First Semester		Second Semester	
Eng 101 Composition I	3	Eng 102 Composition II	3
Core Requirements	12	Psy 101 General Psychology	3
CST 101 Core Studies I	1	Core Requirements	9
PE 100 Activity	0	PE 100 Activity	0
	16		15

Third Semester		Fourth Semester	
Eng 151 Western World Literature	3	Eng 254 Survey of English Literature II	3
Eng 253 Survey of English Literature I	3	Eng 201 Advanced Composition	3
Eng 225 Comparative Grammar	3	Major Elective	3
Ed 101 Practicum in Education	1	Ed 102 Practicum in Education	1
Ed 201 Introduction to Education	3	Ed 202 Educational Psychology	3
Core Requirement	3	Core Requirement	3
	15		16

Fifth Semester		Sixth Semester	
Eng 305 Teaching of English	3	Eng 306 Teaching of English	3
Major Electives	6	Eng 220 History of English	3
Core Requirement	3	Core Requirement	3
Free Elective	3	Major Electives	6
	15		15

Seventh Semester		Eighth Semester	
Eng 397 Seminar	3	Ed 371 Individual in the Classroom	3
Major Electives	6	Ed 380 Professional Semester	15
Free Electives	6		
	15		18

ENG 99. ENGLISH AS A SECOND LANGUAGE **Three credits**
An introduction to English for non-native speakers.

ENG 100. WRITING WORKSHOP **Three credits**
A developmental course concentrating on the fundamentals of writing. Combines extensive practice in the writing of expository prose with systematic study of grammar and rhetoric.

ENG 101. COMPOSITION **Three credits**
Principles of exposition; collateral reading; writing of themes.

ENG 102. COMPOSITION **Three credits**
Principles of exposition continued; introduction to literature; writing of themes; research paper.
Prerequisite: Eng 101 or Eng 100.

ENG 151. WESTERN WORLD LITERATURE **Three credits**
Study of western world literature to the beginning of the eighteenth century; lectures, quizzes, conferences.
Prerequisite: Eng 102, or equivalent in composition.

ENG 152. WESTERN WORLD LITERATURE **Three credits**
Survey of western world literature from the eighteenth century to the present.
Prerequisite: Eng 151.

ENG 201. ADVANCED COMPOSITION **Three credits**
A study of rhetorical types and strategies. Reading and intensive practice. Designated Writing Intensive.
Prerequisite: Eng 102.

ENG 202. TECHNICAL WRITING **Three credits**
A study of the types and strategies of technical writing. Reading and intensive practice. Designated Writing Intensive.
Prerequisite: Eng 102.

ENG 203. CREATIVE WRITING **Three credits**
Training in the selection and use of materials for writing the short story; attention is also given to some poetic forms and to the writing of short plays. Designated Writing Intensive.
Prerequisite: Eng 102.

ENG 220. HISTORY OF THE ENGLISH LANGUAGE **Three credits**
Study of the origins of the English language and of the principal phenomena of later development.
Prerequisite: Eng 152 or 254.

ENG 222. INTRODUCTION TO LINGUISTICS **Three credits**
An introduction to the methods and materials of linguistic analysis.
Prerequisite: Eng 152 or 254 and 220 or consent of instructor.

ENG 225. COMPARATIVE GRAMMAR **Three credits**
A comparative and critical study of traditional and structural English grammar.
Prerequisite: Eng 152 or 254 and 220 or consent of instructor.

ENG 226. TRANSFORMATIONAL GRAMMAR **Three credits**
Intensive study of the principles of generative-transformational grammar and their applications in the analysis of English.
Prerequisite: Eng 152 or 254 and 220 or consent of instructor.

ENG 253. SURVEY OF ENGLISH LITERATURE **Three credits**
A study of the works and movements in English literature from Anglo-Saxon period through the eighteenth century.
Prerequisite: Eng 102.

ENG 254. SURVEY OF ENGLISH LITERATURE **Three credits**
A study of the works and movements in English literature from the Romantic movement to the present.
Prerequisite: Eng 253.

ENG 301. LITERARY CRITICISM **Three credits**
A study of literary theory and the techniques of analysis.
Prerequisite: Eng 152 or 254.

ENG 305-306. THE TEACHING OF ENGLISH **Six credits**
A study of methods of teaching English. The first course concentrates on the methodology of teaching reading in an English class; the second on preparing and presenting lesson, unit, and semester plans for teaching composition, literature, and language. Students must concurrently work in the Writing Center a minimum of 3 hours a week.
Prerequisite: Eng 152 or 254 and permission of department chairperson.

ENG 310. MEDIEVAL ENGLISH LITERATURE **Three credits**
A study of English literature to 1500, exclusive of Chaucer.
Prerequisite: Eng 152 or 254.

ENG 312. CHAUCER **Three credits**
Study of Chaucer's major works, including "The Canterbury Tales" and "Troilus and Criseyde."
Prerequisite: Eng 152 or 254.

ENG 320. TUDOR PROSE AND POETRY **Three credits**
Study of English non-dramatic literature from 1485 to 1603.
Prerequisite: Eng 152 or 254.

ENG 321. EARLY ENGLISH DRAMA **Three credits**
Study of the drama from the tenth century to 1642; reading of plays by pre-Elizabethan and Elizabethan dramatists exclusive of Shakespeare.
Prerequisite: Eng 152 or 254.

ENG 325. SHAKESPEARE **Three credits**
A study of selected plays; written reports on others not studied in class.
Prerequisite: Eng 152 or 254.

ENG 330. SEVENTEENTH CENTURY PROSE AND POETRY **Three credits**
A study of the non-dramatic literature of the period.
Prerequisite: Eng 152 or 254.

ENG 335. MILTON **Three credits**
A study of Milton's poetry and major prose.
Prerequisite: Eng 152 or 254.

ENG 341. RESTORATION & EIGHTEENTH CENTURY DRAMA **Three credits**
Study of the drama from 1600 to 1780.
Prerequisite: Eng 152 or 254.

ENG 343. THE EIGHTEENTH CENTURY **Three credits**
Study of the chief poets and essayists of the eighteenth century.
Prerequisite: Eng 152 or 254.

ENG 345. EARLY ENGLISH NOVEL **Three credits**
Study of English prose fiction of the sixteenth and seventeenth centuries; rise of the novel to the close of the eighteenth century.
Prerequisite: Eng 152 or 254.

ENG 354. ROMANTIC PROSE AND POETRY **Three credits**
Study of chief poets and prose writers of the Romantic Period.
Prerequisite: Eng 152 or 254.

ENG 360. VICTORIAN PROSE AND POETRY **Three credits**
Readings in Tennyson, Browning, Arnold, and other significant writers of the Victorian Age.
Prerequisite: Eng 152 or 254.

ENG 366. LATER ENGLISH NOVEL **Three credits**
Study of the major novelists of the nineteenth and early twentieth centuries.
Prerequisite: Eng 152 or 254.

ENG 370. MODERN BRITISH POETRY **Three credits**
Study of major British poetry of the twentieth century.
Prerequisite: Eng 152 or 254.

ENG 372. MODERN NOVEL — **Three credits**
Study of the major novels of the twentieth century.
Prerequisite: Eng 152 or 254.

ENG 374. MODERN DRAMA — **Three credits**
Study of important dramatists, European and American, from the time of Ibsen.
Prerequisite: Eng 152 or 254.

ENG 381. AMERICAN LITERATURE I — **Three credits**
A study of American literature to the Civil War.
Prerequisite: Eng 152 or 254.

ENG 382. AMERICAN LITERATURE II — **Three credits**
A study of American literature from the Civil War to the present time.
Prerequisite: Eng 152 or 254.

ENG 383. AMERICAN NOVEL — **Three credits**
A study of the American novel from its beginning to the present.
Prerequisite: Eng 152 or 254.

ENG 384. AMERICAN DRAMA — **Three credits**
A study of the American drama from the colonial period to the present.
Prerequisite: Eng 152 or 254.

ENG 386. MODERN AMERICAN POETRY — **Three credits**
Study of major movements and representative figures in modern American poetry.
Prerequisite: Eng 152 or 254.

ENG 391-392. PROJECTS IN WRITING — **One to three credits**
Independent projects in writing for advanced students.
Prerequisite: Six credits in advanced writing, and permission of department chair.

ENG 395-396. INDEPENDENT RESEARCH — **One to three credits**
Independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.
Prerequisite: Approval of department chair is required.

ENG 397. SEMINAR **(Maximum of three credits per student)** **One to three credits**
Presentations and discussions of selected topics.
Prerequisite: Approval of department chair is required.

ENG 399. COOPERATIVE EDUCATION — **Three or six credits**
Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)
Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

ENG 198/298/398. TOPICS — **Variable credit**
The study of a special topic in language, literature, or criticism. Possible topics include literature and science, Black literature, semiotics, children's literature, literature and film, literature and religion, etc.
Prerequisite: Eng 152 or 254.

FOREIGN LANGUAGES

Associate Professor Karpinich, Chairperson; Assistant Professor R. Steele.

Total minimum number of credits required for a major in Foreign Language leading to the B.A. degree — 121.
Total minimum number of credits required for a minor — 18.

Study of foreign languages and literature develops competence in another language, promotes personal and international understanding and cultivates an appreciation for the differences among cultures. Command of a foreign language enables students to advance their foreign language studies at the graduate level, or pursue a broad range of career opportunities in the fields of teaching, domestic and international commerce, government service, industry, and many others.

French, German, and Spanish are offered as major fields of study. A major in foreign language consists of twenty-four credit hours in advanced language courses beyond the 204 course. These twenty-four credits must normally include 301-302. Students seeking public school certification must also take 205, 206, 207, 208, 350 and 390.

In order to broaden career options, all foreign language majors are advised to combine their language studies with another discipline. Students who decide on a career in education are encouraged to study another language. All majors are urged to spend at least a semester of study abroad arranged through the Study Abroad Coordinator.

In addition to the major, students may elect to minor in French, German, or Spanish. A minor in foreign language consists of eighteen credit hours beyond 102. Students may also undertake a two-year study of Russian. Other languages such as Japanese, Italian, Latin, Hebrew, Polish and Ukrainian are offered on a demand basis (see page 146).

Students majoring in foreign language may pursue a five-year program of study leading to a Master of Business Administration Degree. Information about this program and about career possibilities may be obtained in the office of the Department of Foreign Languages, Room 201, Kirby Hall.

NOTE: The minimum foreign language requirement for all incoming students is competence at the 102 or higher level. Students may be exempted from the requirement if they have completed the 102 (or equivalent) college foreign language course, or if they can demonstrate competence by scoring at the 102 level on a proficiency examination administered by the Department of Foreign Languages at the time of initial registration. Tests are available in French, Spanish, and German and, by special arrangement, in a variety of other languages.

Students who graduated from secondary schools at which the primary language of instruction was **not** English satisfy the foreign language requirement by submission of a TOEFL score adequate for admission to Wilkes.

FRENCH

Recommended Course Sequence for a Major in French

First Semester		Second Semester	
Eng 101 Composition I	3	Eng 102 Composition II	3
Fr 101 Elementary I	3	Fr 102 Elementary II	3
Core Requirements	9	Core Requirements	9
CST 101 Core Studies I	1	PE 100 Activity	0
PE 100 Activity	0		15
	16		
Third Semester		**Fourth Semester**	
Fr 203 Intermediate I	3	Fr 204 Intermediate II	3
Core Requirements	12	Core Requirements	12
	15		15
Fifth Semester		**Sixth Semester**	
Fr 205 Conversation	3	Fr 206 Advanced Conversation	3
Major Elective	3	Major Elective	3
Free Electives	9	Free Electives	9
	15		15
Seventh Semester		**Eighth Semester**	
Major Electives	6	Major Electives	6
Free Electives	9	Free Electives	9
	15		15

FR 101-102. ELEMENTARY FRENCH **Three credits each**
Fundamentals of spoken and written French, and introduction to French culture. Includes systematic coverage of basic French grammar. Work in language laboratory required. Not recommended for students having completed two or more years of high school French.

FR 203-204. INTERMEDIATE FRENCH **Three credits each**
Emphasis on development of proficiency in spoken and written French. Includes review and further study of grammar. Oral and written work based upon short cultural and literary texts. Work in language laboratory required.
Prerequisite: Fr 102 or two years of high school French or permission of instructor.

FR 205. CONVERSATION **Three credits**
Practice in spoken French with emphasis on mastery of idiomatic expression. Informal discussions, reports, debates, and written compositions. Work in language laboratory.
Prerequisite: Fr 204 or permission of instructor.

FR 206. ADVANCED CONVERSATION **Three credits**
Advanced practice in spoken French with emphasis on special problems of idiomatic expression. Discussions, reports, debates, and written compositions on topics of current interest in the French-speaking world.
Prerequisite: Fr 205 or permission of instructor.

FR 207. PHONETICS **Three credits**
A contrastive study of the sound systems of modern French and modern English. Intensive oral and aural practice including work in the language laboratory.
Prerequisite: Fr 204 or permission of instructor.

FR 208. CULTURE AND CIVILIZATION **Three credits**
Systematic introduction to the political, social, economic, and cultural characteristics of France and the French-speaking world. Readings from a variety of sources including the French press.
Prerequisite: Fr 204 or permission of instructor.

FR 298. STUDIES IN LANGUAGE AND CULTURE **Three credits**
Development of a particular language skill or investigation of an aspect of French culture. Possible topics include translation, commercial French, French in North America or Africa, the French press, and the Fifth Republic. May be repeated for credit.
Prerequisite: Fr 204 or permission of instructor.

FR 301-302. SURVEY OF FRENCH LITERATURE **Three credits each**
Survey of representative works from the middle ages to the present. Introduction to major movements, literary traditions, genres, and writers.
Prerequisite: Fr 204 or permission of instructor.

FR 350. ADVANCED GRAMMAR AND COMPOSITION **Three credits**
Analysis of a variety of French texts and extensive writing practice. Work on special problems of grammar and idiomatic expression.
Prerequisite: Fr 204 or permission of instructor.

FR 390. THE TEACHING OF FRENCH **Three credits**
Examination of methods and techniques of foreign-language teaching. Practical exercises in preparation and presentation of instructional materials.
Prerequisite: Senior standing and permission of department chairperson.

FR 395-396. INDEPENDENT RESEARCH **One to three credits each**
Independent study and research in the field of the major under the direction of a staff member.
Prerequisite: Approval of department chairperson.

FR 397. SEMINAR **(Maximum of three credits per student) One to three credits**
Presentations and discussions of selected topics.
Prerequisite: Approval of department chairperson.

FR 399. COOPERATIVE EDUCATION **Three or six credits**
Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)
Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

FR 198/298/398. TOPICS **Variable credit**
Examination of special topics in French literature. Possible topics include existentialism, surrealism, symbolism, realism and naturalism, the enlightenment, classical drama, the 19th century novel, the *nouveau roman,* Proust, Baudelaire, and Moliére. May be repeated for credit.
Prerequisite: Fr 301-302 or permission of instructor.

GERMAN

Recommended Course Sequence for a Major in German

First Semester		Second Semester	
Eng 101 Composition I	3	Eng 102 Composition II	3
Gr 101 Elementary I	3	Gr 102 Elementary II	3
Core Requirements	9	Core Requirements	9
CST 101 Core Studies I	1	PE 100 Activity	0
PE 100 Activity	0		
	16		15

Third Semester		Fourth Semester	
Gr 203 Intermediate I	3	Gr 204 Intermediate II	3
Core Requirements	12	Core Requirements	12
	15		15

Fifth Semester		Sixth Semester	
Gr 205 Conversation	3	Gr 206 Advanced Conversation	3
Major Elective	3	Major Elective	3
Free Electives	9	Free Electives	9
	15		15

Seventh Semester		Eighth Semester	
Major Electives	6	Major Electives	6
Free Electives	9	Free Electives	9
	15		15

GR 101-102. ELEMENTARY GERMAN **Three credits each**

Fundamentals of spoken and written German, and introduction to German culture. Includes systematic coverage of basic German grammar. Work in language laboratory required. Not recommended for students having completed two or more years of high school German.

GR 203-204. INTERMEDIATE GERMAN **Three credits each**

Emphasis on development of proficiency in spoken and written German. Includes review and further study of grammar. Oral and written work based upon short cultural and literary texts. Works in language laboratory required.

Prerequisite: Gr 102 or two years of high school German or permission of instructor.

GR 205. CONVERSATION **Three credits**

Practice in spoken German with emphasis on mastery of idiomatic expression. Informal discussions, reports, debates, and written compositions. Work in language laboratory.

Prerequisite: Gr 204 or permission of instructor.

GR 206. ADVANCED CONVERSATION **Three credits**

Advanced practice in spoken German with emphasis on special problems of idiomatic expression. Discussions, reports, debates, and written compositions on topics of current interest in the German-speaking world.

Prerequisite: Gr 205 or permission of instructor.

GR 207. PHONETICS **Three credits**

A contrastive study of the sound systems of modern German and modern English. Intensive oral and aural practice including work in the language laboratory.

Prerequisite: Gr 204 or permission of instructor.

GR 208. CULTURE AND CIVILIZATION **Three credits**

Systematic introduction to the political, social, economic, and cultural characteristics of the Federal Republic of Germany. Readings from a variety of sources including the German press.

Prerequisite: Gr 204 or permission of instructor.

GR 298. STUDIES IN LANGUAGE AND CULTURE **Three credits**

Development of a particular language skill or investigation of an aspect of German culture. Possible topics include translation, commercial German, the German press BRD and the DDR, and the Third Reich. May be repeated for credit.

Prerequisite: Gr 204 or permission of instructor.

GR 301-302. SURVEY OF GERMAN LITERATURE **Three credits each**

Survey of representative works from the middle ages to the present. Introduction to major movements, literary traditions, genres, and writers.

Prerequisite: Gr 204 or permission of instructor.

GR 350. ADVANCED GRAMMAR AND COMPOSITION **Three credits**

Analysis of a variety of German texts and extensive writing practice. Work on special problems of grammar and idiomatic expression.

Prerequisite: Gr 204 or permission of instructor.

GR 390. THE TEACHING OF GERMAN **Three credits**

Examination of methods and techniques of foreign-language teaching. Practical exercises in preparation and presentation of instructional materials.

Prerequisite: Senior standing and permission of department chairperson.

GR 395-396. INDEPENDENT RESEARCH **One to three credits each**

Independent study and research in the field of the major under the direction of a staff member.

Prerequisite: Approval of department chairperson.

GR 397. SEMINAR **(Maximum of three credits per student) One to three credits**

Presentations and discussions of selected topics.

Prerequisite: Approval of department chairperson.

GR 399. COOPERATIVE EDUCATION **Three or six credits**

Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)

Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

GR 198/298/398. TOPICS **Variable credit**

Examination of special topics in German literature. Possible topics include expressionism, naturalism, romanticism, storm and stress, the *Roman,* the *Novelle,* Goethe, Hauptmann, Rilke, and Kafka. May be repeated for credit.

Prerequisite: Gr 301-302 or permission of instructor.

RUSSIAN AND OTHER LANGUAGES

The Department of Foreign Languages and Literature offers a two-year program in Russian.

Languages not included in the regular curriculum may be offered as demand arises and as circumstances permit. Languages that may be offered include Polish, Ukrainian, Hebrew, Italian, Japanese, and Latin. Interested students should contact the department chairperson.

RUS 101-102. ELEMENTARY RUSSIAN **Three credits each**
Fundamentals of spoken and written Russian, and introduction to Russian culture. Includes systematic coverage of basic Russian grammar. Work in language laboratory required. Not recommended for students having completed two or more years of high school Russian.

RUS 203-204. INTERMEDIATE RUSSIAN **Three credits each**
Emphasis on development of proficiency in spoken and written Russian. Includes review and further study of grammar. Oral and written work based upon short cultural and literary texts. Work in language laboratory required.
Prerequisite: Rus 102 or two years of high school Russian or permission of instructor.

RUS 198/298. TOPICS **Three credits**
Investigation of an aspect of the language, literature or culture. May be repeated for credit.
Prerequisite: Permission of instructor.

OTHER LANGUAGES
(As described above)

101-102. **Three credits each**
Designed to develop fundamental skills in the selected language and to introduce students to the culture. Includes systematic coverage of basic grammar supplemented with work in language laboratory where appropriate.

203-204. **Three credits each**
Continued study of grammar and development of proficiency in basic language skills. Exercises based on short cultural and literary texts.
Prerequisite: 102 or permission of instructor.

198/298. STUDIES IN LANGUAGE AND CULTURE **Three credits**
Investigation of an aspect of the selected language and culture. May be repeated for credit.
Prerequisite: Permission of instructor.

SPANISH
Recommended Course Sequence for a Major in Spanish

First Semester		Second Semester	
Eng 101 Composition I	3	Eng 102 Composition II	3
Sp 101 Elementary I	3	Sp 102 Elementary II	3
Core Requirements	9	Core Requirements	9
CST 101 Core Studies I	1	PE 100 Activity	0
PE 100 Activity	0		
	16		15

Third Semester		Fourth Semester	
Sp 203 Intermediate I	3	Sp 204 Intermediate II	3
Core Requirements	12	Core Requirements	12
	15		15

Fifth Semester		Sixth Semester	
Sp 205 Conversation	3	Sp 206 Advanced Conversation	3
Major Elective	3	Major Elective	3
Free Electives	9	Free Electives	9
	15		15

Seventh Semester		Eighth Semester	
Major Electives	6	Major Electives	6
Free Electives	9	Free Electives	9
	15		15

SP 101-102. ELEMENTARY SPANISH **Three credits each**
Fundamentals of spoken and written Spanish, and introduction to Spanish culture. Includes systematic coverage of basic Spanish grammar. Work in language laboratory required. Not recommended for students having completed two or more years of high school Spanish.

SP 203-204. INTERMEDIATE SPANISH **Three credits each**
Emphasis on development of proficiency in spoken and written Spanish. Includes review and further study of grammar. Oral and written work based upon short cultural and literary texts. Work in language laboratory required.
Prerequisite: Sp 102 or two years of high school Spanish or permission of instructor.

SP 205. CONVERSATION **Three credits**
Practice in spoken Spanish with emphasis on mastery of idiomatic expression. Informal discussions, reports, debates, and written compositions. Work in language laboratory.
Prerequisite: Sp 204 or permission of instructor.

SP 206. ADVANCED CONVERSATION **Three credits**
Advanced practice in spoken Spanish with emphasis on special problems of idiomatic expression. Discussions, reports, debates, and written compositions on topics of current interest in the Spanish-speaking world.
Prerequisite: Sp 205 or permission of instructor.

SP 207. PHONETICS **Three credits**
A contrastive study of the sound system of modern Spanish and modern English. Intensive oral and aural practice including work in the language laboratory.
Prerequisite: Sp 204 or permission of instructor.

SP 208. CULTURE AND CIVILIZATION **Three credits**
Systematic introduction to the political, social, economic, and cultural characteristics of Spain and the Spanish-speaking world. Readings from a variety of sources including the Spanish press.
Prerequisite: Sp 204 or permission of instructor.

SP 209. LATIN AMERICAN CULTURE AND CIVILIZATION **Three credits**
Systematic study of the historical, cultural, economic, and political development of the countries of Latin America (Spanish-speaking countries and Brazil). Pre-Columbus cultures (Maya, Aztec, and Inca) will be examined. Use of audio-visual material and other activities included.
Prerequisite: Sp 204 or permission of instructor.

SP 298. STUDIES IN LANGUAGE AND CULTURE **Three credits**
Development of a particular language skill or investigation of an aspect of Spanish culture. Possible topics include translation, commercial Spanish, Spanish for Health Science Careers, Spanish Folklore, Spanish-American Folklore, and others. May be repeated for credit.
Prerequisite: Sp 204 or permission of instructor.

SP 301-302. SURVEY OF SPANISH LITERATURE **Three credits each**
Survey of representative works from the middle ages to the present. Introduction to major movements, literary traditions, genres, and writers.
Prerequisite: Sp 204 or permission of instructor.

SP 308-309. SURVEY OF SPANISH-AMERICAN LITERATURE **Three credits each**
A survey of the evolution of Spanish-American literature from the discovery to the present. Readings from outstanding works from different periods and regions.
Prerequisite: Sp 204 or permission of instructor.

SP 350. ADVANCED GRAMMAR AND COMPOSITION **Three credits**
Analysis of a variety of Spanish texts and extensive writing practice. Work on special problems of grammar and idiomatic expression.
Prerequisite: Sp 204 or permission of instructor.

SP 390. THE TEACHING OF SPANISH **Three credits**
Examination of methods and techniques of foreign-language teaching. Practical exercises in preparation and presentation of instructional materials.
Prerequisite: Senior standing and permission of department chairperson.

SP 395-396. INDEPENDENT RESEARCH **One to three credits each**
Independent study and research in the field of the major under the direction of a staff member.
Prerequisite: Approval of department chairperson.

SP 397. SEMINAR **(Maximum of three credits per student) One to three credits**
Presentations and discussions of selected topics.
Prerequisite: Approval of department chairperson.

SP 399. COOPERATIVE EDUCATION **Three or six credits**
Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)
Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

SP 198/298/398. TOPICS **Variable credit**
Examination of special topics in Spanish literature. Possible topics include the drama of the Golden Age, the nineteenth century Spanish novel, Cervantes and Don Quixote, modernism, and the novel of the Mexican Revolution. May be repeated for credit.
Prerequisite: Sp 301-302 or permission of instructor.



HISTORY

Professor Berlatsky, Chairperson; Professors Emeriti Kaslas, Leach; Professors Breiseth, Cox, Rodechko, Shao; Assistant Professors Berg, Hupchick, Meyers; Adjunct Faculty Thomas.

Total minimum number of credits required for a major in History leading to the B.A. degree — 121.

Total minimum number of credits required for a minor — 18.

Wilkes University requires 121 credit hours for the B.A. degree in history. These include 46 credit hours in core courses and 30 credit hours in history. History 101-102, History 207-208, and 18 credit hours in history courses numbered 300 and above are required. The 300-level courses must include a minimum of six hours each in American and non-American topics.

A variety of career options are open to history majors. Since history is a synthesis of the life experience that examines past economic, social, political, scientific, and religious conditions, a careful selection of history courses and elective credit hours will allow students to pursue career interests in business, government, teaching, communications, law, and social service. The history major includes a considerable number of elective credit hours that students may use to develop career interests. The Department also has a 5-year program leading to a B.A. in History and a Masters in Business Administration.

A minor in history shall consist of 18 credit hours in courses offered by the department. These should include the 101-102 sequence.

Recommended Course Sequence for a Major in History

First Semester		Second Semester	
Hst 101 World Civilization I	3	Hst 102 World Civilization II	3
Eng 101 Composition I	3	Eng 102 Composition II	3
Core Requirements	9	Core Requirements	9
CST 101 Core Studies I	1	PE 100 Activity	0
PE 100 Activity	0		
	16		15

Third Semester		Fourth Semester	
Hst 207 American History I	3	Hst 208 American History II	3
Core Requirements	12	Core Requirements	9
		Free Elective	3
	15		15

Fifth Semester		Sixth Semester	
Major Electives	6	Major Electives	6
Free Electives	9	Free Electives	9
	15		15

Seventh Semester		Eighth Semester	
Major Elective	3	Major Elective	3
Free Electives	12	Free Electives	13
	15		16

HST 101-102. WORLD CIVILIZATION **Three credits each**

This course is designed as a survey of all the basic cultures of the world. The major portion of the course will be devoted to the development of western civilization. Attention will also be given to the part played by America in world history, especially during the expansion of Europe and in the twentieth century.

Offered every semester.

HST 105. HUMANS AND MACHINES: TECHNOLOGY AND HISTORY **Three credits**

An examination of technological changes and the manner in which they have affected the modern world, particularly the contemporary United States. Topics considered include society, environment, communications media and transportation, the city, the home, and the changing role of women in a mature industrial society.

HST 207-208. AMERICAN HISTORY **Three credits each**

A general survey of American history from colonial times to the present.

Offered every year.

HST 315. READINGS IN ANCIENT HISTORY: THE NEAR EAST **Three credits**

Selected readings on the history of the Ancient Near East, with emphasis on primary sources. Conferences with instructor and paper.

Offered in alternate years.

HST 316. READINGS IN ANCIENT HISTORY: THE CLASSICAL WORLD **Three credits**

Selected readings on the history of Greece and Rome, with emphasis on primary sources. Conferences with instructor and paper.

Offered in alternate years.

HST 321. AMERICAN SOCIAL HISTORY **Three credits**

This course entails a consideration of the development of American society from the colonial period until present time. Attention will especially focus on the rise of industrialism and its impact on society in the late nineteenth and twentieth centuries.

Offered every third year.

HST 322. AMERICAN INTELLECTUAL HISTORY **Three credits**

This course is a survey of the formative ideas which seem most to have influenced American perceptions of the individual, society, and the drift of human affairs. The focus is upon the late nineteenth and early twentieth centuries because this period is the time when seminal ideas were articulated in America.

Offered every fourth year.

HST 324. AMERICAN ECONOMIC HISTORY **Three credits**
A survey of the evolution of the American economy from colonial dependency to modern industrial maturity. Emphasis will be placed upon the development of the United States as an industrial world power since about 1850.
Offered every third year.

HST 325. AMERICAN ETHNIC HISTORY **Three credits**
A study of the institutions and problems that have characterized various immigrant, black, and Indian communities from colonial times to the present.
Offered every fourth year.

HST 328. HISTORY OF THE FOREIGN POLICY OF THE UNITED STATES **Three credits**
A selective treatment of major themes in American foreign policy from the founding of the Republic to the present.
Offered in alternate years.

HST 331. COLONIAL AMERICA **Three credits**
Discovery, exploration, and settlement; development of social, political, religious, and intellectual institutions; independence and political reorganization.
Offered in alternate years.

HST 332. THE NATIONAL PERIOD **Three credits**
A study of the political and economic history of the United States from 1783 to 1865. Special attention will be given to the evolution of sectional differences and the culmination of these differences in intersectional warfare.
Offered in alternate years.

HST 333. THE AGE OF BIG BUSINESS, 1865-1914 **Three credits**
A study of the political and economic history of the United States from 1865 to 1914. Special attention will be paid to the period of congressional dominance and the restoration of presidential power at the turn of the century; the economic, social, and political consequences of the industrial revolution; and the rise of urban America.
Offered in alternate years.

HST 334. THE UNITED STATES, 1900-1945 **Three credits**
The emergence of the United States as a world power and the corresponding development of its political, economic, social, and religious institutions.
Offered in alternate years.

HST 335. THE UNITED STATES SINCE 1945 **Three credits**
An examination of the political, social, and economic changes in the United States since World War II. Special attention is paid to America's dominant role in the immediate post-war world and how changing conditions over the past forty years have altered this role.
Offered in alternate years.

HST 341-342. HISTORY OF GREAT BRITAIN AND THE BRITISH EMPIRE AND COMMONWEALTH **Three credits each**
A study of British history from the Neolithic period to present times. The first semester will cover social, economic, and political developments to 1783, including expansion overseas. The second semester will cover the consequences of the industrial revolution and the evolution of the Empire into the Commonwealth.
Offered every third year.

HST 348. HISTORY OF RUSSIA **Three credits**
A study of the political, social, and intellectual history of Russia. Emphasis is placed upon the emergence of Russia as a major power after 1700.
Offered in alternate years.

HST 351. READINGS IN MEDIEVAL EUROPE **Three credits**
Selected readings on the history of Medieval Europe, with emphasis on primary sources. Conferences with instructor and paper.
Offered in alternate years.

HST 352. THE RENAISSANCE AND REFORMATION **Three credits**
Within the political and economic framework of the period, study will be made of the culture of the Renaissance, the religious reforms and conflicts resulting from the crisis in the sixteenth century.
Offered every third year.

HST 353. AGE OF ABSOLUTISM **Three credits**
The political, social, economic, intellectual, and cultural development of Europe and dependencies from 1600 to about 1750.
Offered every third year.

HST 354. THE ERA OF THE FRENCH REVOLUTION AND NAPOLEON **Three credits**
A study of the structure of the Ancien Regime and an examination of the causes, events, and consequences of the French Revolution culminating in the Napoleonic Empire.
Offered every third year.

HST 355. EUROPE IN THE NINETEENTH CENTURY **Three credits**
A study of the political, social, and cultural development of Europe from the Congress of Vienna to World War I.
Offered in alternate years.

HST 356. EUROPE IN THE TWENTIETH CENTURY **Three credits**
Against a background of the internal and international developments of the leading powers, students will study the origins and results of the two World Wars.
Offered in alternate years.

HST 361-362. HISTORY OF THE FAR EAST **Three credits each**
A study of the history of the civilizations developed in India, China, and Japan with emphasis on their interrelations and distinctive characteristics and on their transformation in response to the penetration of western civilization from the sixteenth century onward. Some attention will be given to similar developments and changes among the countries of Southeast Asia. Fall semester: to c. 1760. Spring semester: 1760 to present.
Offered every third year.

HST 363. HISTORY OF MODERN CHINA **Three credits**
A study of Chinese history since 1840 with special emphasis on social, political, economic, and intellectual developments.
Offered every third year.

HST 364. DIPLOMATIC HISTORY OF THE FAR EAST **Three credits**
A study of the relationship of the states of the Far East with one another and the West in the nineteenth and twentieth centuries.
Offered every third year.

HST 365. HISTORY OF CHINESE COMMUNISM **Three credits**
This course is designed to examine the origins of Chinese Communism, the rise of the Chinese Communist Party to national power, and the essential features of Mao Tse-Tung's strategies and policies.
Offered every third year.

HST 367. HISTORY OF MODERN INDIA **Three credits**
A study of the political, social, and economic development of the Indian sub-continent since 1500.
Offered every third year.

HST 376. WORLD WAR II **Three credits**
Consideration of the causes of the war, military strategy and tactics, diplomatic interests of the participants, and resulting cold war problems.
Offered in alternate years.

HST 391. HISTORIOGRAPHY AND RESEARCH **Three credits**
An introduction to historical research and writing. The writings and ideas of major historians of the past and present are examined. The student is exposed to research methods, particularly in the area of primary sources, and to the construction and criticism of the historical monograph.
Prerequisite: Approval of instructor.

HST 395-396. INDEPENDENT RESEARCH **One to three credits**
Independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.
Prerequisite: Approval of department chairman.
Offered every semester.

HST 397. SEMINAR (Maximum of three credits per student) One to three credits
Presentations and discussions of selected topics.
Prerequisite: Approval of instructor is required.

HST 399. COOPERATIVE EDUCATION **Three or six credits**
Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)
Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

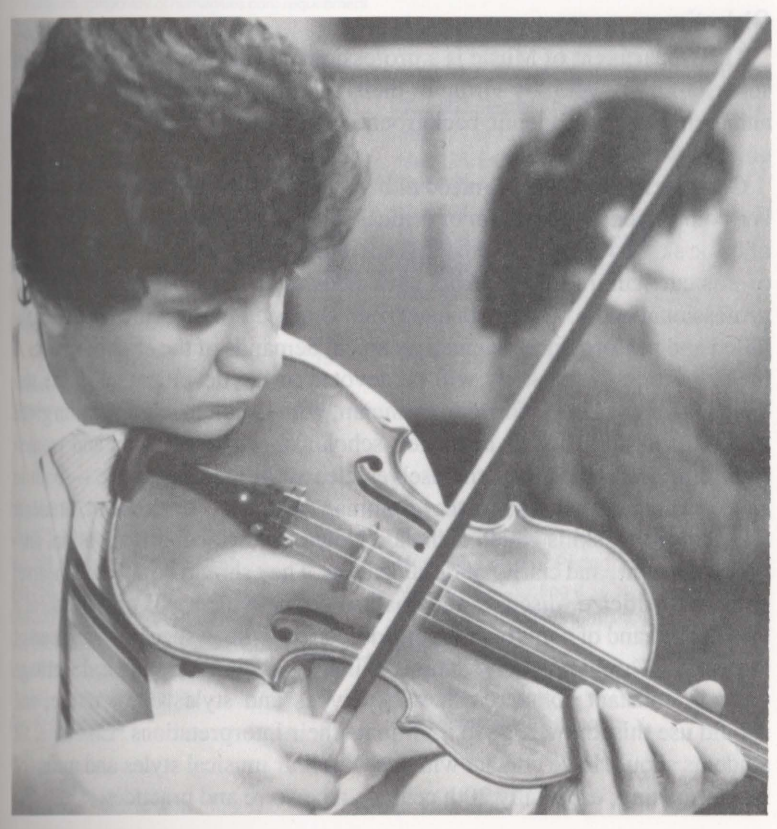
HST 198/298/398. TOPICS **Variable credit**
Special topics in history. This course will be offered from time to time when interest and demand justify it.

INDIVIDUALIZED STUDIES

This program is designed for those capable and motivated students who wish to undertake a course of study that cannot be provided for under any of the normal B.A., B.S. degree programs. The student will be responsible for generating a coherent proposal for a program of studies. This proposal must be selected by the student, approved by an advisor, and then by the Individualized Studies Committee. The program of studies may include courses offered by all departments at Wilkes University. In addition, credit may be assigned for appropriate off-campus study, work, and/or travel. Credits may be granted for knowledge or experience obtained prior to enrollment, with approval of the appropriate department and the Individualized Studies Committee.

Degree Requirements

The basic requirement for the degree in Individualized Studies is the accumulation of 121 credits. Although there are no specific course requirements, the spirit of the Wilkes University core curriculum is to be respected.



MUSIC

Associate Professor Campbell, Chairman; Professors Emeriti Chapline, A. Liva; Associate Professor Emeritus Garber; Associate Professor Santos; Assistant Professors Barton, Chang, Reiprich, Rinehart; Adjunct Faculty Hannigan, Harrington, Heinze, Hrynkiw, Metzger, Nowak, Rinert, Sanderson, Teubner.

Total minimum number of credits required for a major in Music leading to the B.M. degree — number varies with program.

Purposes

The Music Major at Wilkes University leads to a Bachelor of Music degree. Various concentrations in applied performance studies and certification in music education (K-12) are offered.

The purposes of the program are to:

1. Give students a comprehensive exposure to all aspects of musical training relevant to their degree specialization;
2. Provide for contemporary careers in music;
3. Substantively prepare the student for graduate studies in music.

Objectives

The Department of Music is a professional academic unit for students of superior ability who, by virtue of their musical aptitude and achievements and their general academic background, are qualified to pursue work at the university level.

Certain criteria are recognized as basic to any curriculum in music. There is a comprehensive program of critical and evaluative studies. A command of basic skills widely recognized as attributes of the musician is a major part of this curriculum. These skills have relevance to long-term personal and professional goals. Curricula have been designed to meet the competency-based and performance-oriented technical demands of the craft of music. A major portion of the study will be devoted to the development of the student's potential as a performing musician, with simultaneous attention given to one's specialization as a teacher, scholar or whatever. Men and women should be able to express themselves clearly in their language — both in speech and writing, and in the grammar of music. To this end, students should develop skills which demand evidence of critical investigation, analytical thought, and clarity of organization. They should be able to rehearse, perform, criticize, discuss, and analyze music which will provide them a basic command of components considered requisite to success in any part of the field. They should develop familiarity with their musical heritage through constant contact with varied types and styles of literature, and should use this knowledge to illuminate their interpretations. Likewise, all students should have contact with less familiar musical styles and means of music-making, especially 20th century repertoire and practices.

Recommended Course Sequence for Major in Music — Applied Voice

Program completed with 128 semester credits.

First Semester		Second Semester	
Mus 000 Recital Attendance	0	Mus 000 Recital Attendance	0
Mus 010 Functional Piano*	0	Mus 010 Functional Piano*	0
Mus 100 Applied Performance	2	Mus 100 Applied Performance	2
Mus 103 Comp. Musicianship I	2	Mus 104 Comp. Musicianship II	2
Mus 105 Harmonic Foundations I	3	Mus 106 Harmonic Foundations II	3
Mus 107 Analysis of Music I	3	Mus 108 Analysis of Music II	3
Mus 121 or 131 Ensemble (Minor)**	0	Mus 121 or 131 Ensemble (Minor)**	1
Mus 125 Ensemble (Major)	0	Mus 125 Ensemble (Major)	1
Eng 101 Composition	3	Eng 102 Composition	3
Foreign Language***	3	Foreign Language***	3
CST 101 Core Studies I	1	PE 100 Activity	0
PE 100 Activity	0		
	17		18

*Competency must be passed.
**Either one may be chosen.
***Fulfills one component of humanities core requirement.

Third Semester		Fourth Semester	
Mus 000 Recital Attendance	0	Mus 000 Recital Attendance	0
Mus 121 or 131 Ensemble (Minor)*	0	Mus 121 or 131 Ensemble (Minor)*	1
Mus 125 Ensemble (Major)	0	Mus 125 Ensemble (Major)	1
Mus 200 Applied Performance	2	Mus 200 Applied Performance	2
Mus 203 Comp. Musicianship III	2	Mus 204 Comp. Musicianship IV	2
Mus 205 Harmonic Foundations III	3	Mus 206 Harmonic Foundations IV	3
Mus 207 Analysis of Music III	3	Mus 208 Analysis of Music IV	3
Mus 258 Vocal Methods	2	Mus 259 Diction	2
Foreign Language**	3	Foreign Language**	3
	15		17

*Either may be chosen.
**Equivalent of 6 non-music electives, not additional humanities core.

Fifth Semester		Sixth Semester	
Mus 000 Recital Attendance	0	Mus 000 Recital Attendance	0
Mus 125 Ensemble	0	Mus 125 Ensemble	1
Mus 128 Chamber Performance*	1	Mus 128 Chamber Performance*	1
Mus 260 Conducting I	2	Mus 261 Conducting II	2
Mus 300 Applied Performance	2	Mus 300 Applied Performance	2
Mus 305 Composition/Orchestration	2	Mus 301 Recital	0
Mus 307 Pedagogy (Vocal)	3	Mus 306 20th Century Theory	2
Psy 101 General Psychology	3	Core Requirements	3
Core Requirements	3	Core Requirements	3
	16		14

*Public performance required.

Seventh Semester		Eighth Semester	
Mus 000 Recital Attendance	0	Mus 000 Recital Attendance	0
Mus 125 Ensemble	0	Mus 125 Ensemble	1
Mus 128 Chamber Performance*	1	Mus 400 Applied Performance	2
Mus 400 Applied Performance	2	Mus 401 Recital	0
Mus 407 Music Literature (Voice)	3	Mus 410 Chamber Literature	3
Free Electives	3	Free Electives	4
Core Requirements	6	Core Requirements	6
	15		16

*Public performance required.

Recommended Course Sequence for Major in Music — All Applied Instruments

Except Voice and Keyboard

Program completed with 128 semester credits.

First Semester		Second Semester	
Mus 000 Recital Attendance	0	Mus 000 Recital Attendance	0
Mus 010 Functional Piano	0	Mus 010 Functional Piano	0
Mus 100 Applied Performance	2	Mus 100 Applied Performance	2
Mus 103 Comp. Musicianship I	2	Mus 104 Comp. Musicianship II	2
Mus 105 Harmonic Foundations I	3	Mus 106 Harmonic Foundations II	3
Mus 107 Analysis of Music I	3	Mus 108 Analysis of Music II	3
Mus 121 or 131 Ensemble (Major)*	0	Mus 121 or 131 Ensemble (Major)*	1
Mus 125 Ensemble (Minor)	0	Mus 125 Ensemble (Minor)	1
Eng 101 Composition	3	Eng 102 Composition	3
CST 101 Core Studies I	1	Core Requirements	3
Core Requirements	3	PE 100 Activity	0
PE 100 Activity	0		
	17		18

*Mus 131, if applied string or music education major (string concentration).

Third Semester		Fourth Semester	
Mus 000 Recital Attendance	0	Mus 000 Recital Attendance	0
Mus 121 or 131 Ensemble (Major)*	0	Mus 121 or 131 Ensemble (Major)*	1
Mus 125 Ensemble (Minor)	0	Mus 125 Ensemble (Minor)	1
Mus 200 Applied Performance	2	Mus 200 Applied Performance	2
Mus 203 Comp. Musicianship III	2	Mus 204 Comp. Musicianship IV	2
Mus 205 Harmonic Foundations III	3	Mus 206 Harmonic Foundations IV	3
Mus 207 Analysis of Music III	3	Mus 208 Analysis of Music IV	3
Mus 260 Conducting I	2	Mus 261 or 262 Conducting II	2
Psy 101 General Psychology	3	Core Requirements	3
	15		17

*Mus 131, if applied string or music education major (string concentration).

Fifth Semester		Sixth Semester	
Mus 000 Recital Attendance	0	Mus 000 Recital Attendance	0
Mus 121 or 131 Ensemble*	0	Mus 121 or 131 Ensemble*	1
Mus 128 Chamber Performance**	1	Mus 128 Chamber Performance**	1
Mus 263 or 264 Conducting III	2	Mus 300 Applied Performance	2
Mus 300 Applied Performance	2	Mus 301 Recital	0
Mus 305 Composition/Orchestration	2	Mus 306 20th Century Theory	2
Mus 311-316 Pedagogy	3	Mus 411 Music Literature (Orchestra)	3
Core Requirements	6	Core Requirements	6
	16		15

*Mus 131, if applied string or music education major (string concentration).
**Public performance required.

Seventh Semester		Eighth Semester	
Mus 000 Recital Attendance	0	Mus 000 Recital Attendance	0
Mus 121 or 131 Ensemble*	0	Mus 121 or 131 Ensemble*	1
Mus 128 Chamber Performance**	1	Mus 400 Applied Performance	2
Mus 400 Applied Performance	2	Mus 401 Recital	0
Mus 407-415 Music Lit. (major idiom)	3	Mus 407-415 Music Literature (Chamber Literature)	3
Free Electives***	6	Free Electives***	6
Core Requirements	3	Core Requirements	3
	15		15

*Mus 131, if applied string or music education major (string concentration).
**Public performance required.
***Six elective credits must be non-music.

Recommended Course Sequence for Major in Music — Applied Keyboard

Program completed with 128 semester credits.

First Semester		Second Semester	
Mus 000 Recital Attendance	0	Mus 000 Recital Attendance	0
Mus 100 Applied Performance	2	Mus 100 Applied Performance	2
Mus 103 Comp. Musicianship I	2	Mus 104 Comp. Musicianship II	2
Mus 105 Harmonic Foundations I	3	Mus 106 Harmonic Foundations II	3
Mus 107 Analysis of Music I	3	Mus 108 Analysis of Music II	3
Mus 121 or 131 Ensemble (Minor)*	0	Mus 121 or 131 Ensemble (Minor)*	1
Mus 125 Ensemble (Major)	0	Mus 125 Ensemble (Major)	1
Eng 101 Composition	3	Eng 102 Composition	3
CST 101 Core Studies I	1	Core Requirements	3
Core Requirements	3	PE 100 Activity	0
PE 100 Activity	0		
	17		18

*Either one may be chosen.

Third Semester

Mus 000 Recital Attendance	0
Mus 121 or 131 Ensemble (Minor)*	0
Mus 125 Ensemble (Major)	0
Mus 200 Applied Performance	2
Mus 203 Comp. Musicianship III	2
Mus 205 Harmonic Foundations III	3
Mus 207 Analysis of Music III	3
Mus 212 Keyboard Accompanying	2
Psy 101 General Psychology	3
	15

*Either one may be chosen.

Fourth Semester

Mus 000 Recital Attendance	0
Mus 121 or 131 Ensemble (Minor)*	1
Mus 125 Ensemble (Major)	1
Mus 200 Applied Performance	2
Mus 204 Comp. Musicianship IV	2
Mus 206 Harmonic Foundations IV	3
Mus 208 Analysis of Music IV	3
Mus 213 Accompanying Practicum	1
Core Requirements	3
	16

Fifth Semester

Mus 000 Recital Attendance	0
Mus 125 Ensemble	0
Mus 128 Chamber Performance*	1
Mus 214 Accompanying Practicum	1
Mus 260 Conducting I	2
Mus 300 Applied Performance	2
Mus 305 Composition & Orchestration	2
Mus 309 Pedagogy (Piano)	3
Core Requirements	6
	17

*Public performance required.

Sixth Semester

Mus 000 Recital Attendance	0
Mus 125 Ensemble	1
Mus 128 Chamber Performance*	1
Mus 215 Accompanying Practicum	1
Mus 261 or 262 Conducting II	2
Mus 300 Applied Performance	2
Mus 301 Recital	0
Mus 306 20th Century Theory	2
Core Requirements	6
	15

Seventh Semester

Mus 000 Recital Attendance	0
Mus 125 Ensemble	0
Mus 128 Chamber Performance	1
Mus 400 Applied Performance	2
Mus 409 Keyboard Literature	3
Core Requirements	3
Free Electives**	6
	15

*Public performance required.
**Six elective credits must be non-music.

Eighth Semester

Mus 000 Recital Attendance	0
Mus 125 Ensemble	1
Mus 400 Applied Performance	2
Mus 401 Recital	0
Mus 410 Chamber Literature	3
Core Requirements	3
Free Electives**	6
	15

Recommended Course Sequence for Major in Music — Music Education

Vocal Track (with certification)

Program completed with 139 semester credits.

First Semester

Mus 000 Recital Attendance	0
Mus 010 Functional Piano	0
Mus 100 Applied Performance (Major)	2
Mus 103 Comp. Musicianship I	2
Mus 105 Harmonic Foundations I	3
Mus 107 Analysis of Music I	3
Mus 121 or 131 Ensemble (Minor)*	0
Mus 125 Ensemble (Major)	0
Eng 101 Composition	3
CST 101 Core Studies I	1
Core Requirements	3
PE 100 Activity	0
	17

*Either one may be chosen.

Second Semester

Mus 000 Recital Attendance	0
Mus 010 Functional Piano	0
Mus 100 Applied Performance (Major)	2
Mus 104 Comp. Musicianship II	2
Mus 106 Harmonic Foundations II	3
Mus 108 Analysis of Music II	3
Mus 121 or 131 Ensemble (Minor)*	1
Mus 125 Ensemble (Major)	1
Eng 102 Composition	3
Core Requirements	3
PE 100 Activity	0
	18

Third Semester

Mus 000 Recital Attendance	0
Mus 011 Functional Guitar*	0
Mus 121 or 131 Ensemble (Minor)**	0
Mus 125 Ensemble (Major)	0
Mus 200 Applied Performance (Major)	1
Mus 200 Applied Performance (Minor)	1
Mus 203 Comp. Musicianship III	2
Mus 205 Harmonic Foundations III	3
Mus 207 Analysis of Music III	3
Mus 258 Vocal Methods	2
Mus 260 Conducting I	2
Psy 101 General Psychology	3
	17

*If choral, elementary, or general music concentration.
**Either one may be chosen.

Fourth Semester

Mus 000 Recital Attendance	0
Mus 011 Functional Guitar*	0
Mus 121 or 131 Ensemble (Minor)**	1
Mus 125 Ensemble (Major)	1
Mus 200 Applied Performance (Major)	1
Mus 200 Applied Performance (Minor)	1
Mus 204 Comp. Musicianship IV	2
Mus 206 Harmonic Foundations IV	3
Mus 208 Analysis of Music IV	3
Mus 259 Voice Diction	2
Core Requirements	3
	17

Recommended Course Sequence for Major in Music — Music Education

Instrumental Track (with certification)

Program completed with 139 semester credits.

First Semester		Second Semester	
Mus 000 Recital Attendance	0	Mus 000 Recital Attendance	0
Mus 010 Functional Piano	0	Mus 010 Functional Piano	0
Mus 100 Applied Performance (Major)	2	Mus 100 Applied Performance (Major)	2
Mus 103 Comp. Musicianship I	2	Mus 104 Comp. Musicianship II	2
Mus 105 Harmonic Foundations I	3	Mus 106 Harmonic Foundations II	3
Mus 107 Analysis of Music I	3	Mus 108 Analysis of Music	3
Mus 121 or 131 Ensemble (Major)*	0	Mus 121 or 131 Ensemble (Major)*	1
Mus 125 Ensemble (Minor)	0	Mus 125 Ensemble (Minor)	1
Eng 101 Composition	3	Eng 102 Composition	3
CST 101 Core Studies I	1	Core Requirements	3
Core Requirements	3	PE 100 Activity	0
PE 100 Activity	0		
	17		18

Third Semester		Fourth Semester	
Mus 000 Recital Attendance	0	Mus 000 Recital Attendance	0
Mus 011 Functional Guitar**	0	Mus 011 Functional Guitar**	0
Mus 121 or 131 Ensemble (Major)*	0	Mus 121 or 131 Ensemble (Major)*	1
Mus 125 Ensemble (Minor)	0	Mus 125 Ensemble (Minor)	1
Mus 200 Applied Performance (Major)	1	Mus 200 Applied Performance (Major)	1
Mus 200 Applied Performance (Minor)	1	Mus 200 Applied Performance (Minor)	1
Mus 203 Comp. Musicianship III	2	Mus 204 Comp. Musicianship IV	2
Mus 205 Harmonic Foundations III	3	Mus 206 Harmonic Foundations IV	3
Mus 207 Analysis of Music III	3	Mus 208 Analysis of Music IV	3
Mus 254 Instrumental Methods	2	Mus 255 Instrumental Methods	2
Mus 260 Conducting I	2	Core Requirements	3
Psy 101 General Psychology	3		
	17		17

Fifth Semester		Sixth Semester	
Mus 000 Recital Attendance	0	Mus 000 Recital Attendance	0
Mus 121 or 131 Ensemble (Major)*	0	Mus 121 or 131 Ensemble (Major)*	1
Mus 250 Teaching of Elementary Music	2	Mus 257 Instrumental Methods	2
Mus 256 Instrumental Methods	2	Mus 264 Adv. Conducting III	2
Mus 261 or 262 Conducting II	2	Mus 300 Applied Performance (Major)	1
Mus 300 Applied Performance (Major)	1	Mus 300 Applied Performance (Minor)	1
Mus 300 Applied Performance (Minor)	1	Ed 102 Practicum in Education	1
Ed 101 Practicum in Education	1	Ed 202 Educational Psychology	3
Ed 201 Introduction to Education	3	Core Requirements	6
Core Requirements	6		
	18		17

*Mus 131, if applied string or music education major (string concentration).
**If elementary or general music concentration.

Seventh Semester		Eighth Semester	
Mus 000 Recital Attendance	0	Mus 000 Recital Attendance	0
Mus 121 or 131 Ensemble (Major)*	0	Mus 121 or 131 Ensemble (Major)*	1
Mus 351 Teaching of Sec. Choral Music**	2	Mus 252 Teaching of General Music	2
Mus 352 Teaching of Sec. Instr. Music**	2	Mus 400 Applied Performance (Major)	2
Mus 400 Applied Performance (Major)	2	Mus 401 Recital	0
Ed 382 Intern Teaching	11	Ed 381 Professional Practicum***	4
		Core Requirements	9
	17		18

*Mus 131, if applied string or music education major (string concentration).
**Accelerated courses.
***Accredited from seventh semester.

MUS 000. RECITAL ATTENDANCE **No credit**
This course is required each semester for all music majors. Degree requirement for graduation.

MUS 010. FUNCTIONAL PIANO **No credit**
Class instruction in piano for music majors. Competency must be passed through examination before eligibility to upperclass status. Class meets two hours per week.
Prerequisite: none.

Fifth Semester		Sixth Semester	
Mus 000 Recital Attendance	0	Mus 000 Recital Attendance	0
Mus 125 Ensemble (Major)	0	Mus 125 Ensemble (Major)	1
Mus 250 Teaching of Elementary Music	2	Mus 252 Teaching of General Music	2
Mus 254-257 Instrumental Methods*	2	Mus 263 Adv. Choral Conducting III	2
Mus 261 Conducting II	2	Mus 300 Applied Performance (Major)	1
Mus 300 Applied Performance (Major)	1	Mus 300 Applied Performance (Minor)	1
Mus 300 Applied Performance (Minor)	1	Ed 102 Practicum in Education	1
Ed 101 Practicum in Education	1	Ed 202 Educational Psychology	3
Ed 201 Introduction to Education	3	Core Requirements	6
Core Requirements	6		
	18		17

*Student elects two of four instrumental methods courses.

Seventh Semester		Eighth Semester	
Mus 000 Recital Attendance	0	Mus 000 Recital Attendance	0
Mus 125 Ensemble (Major)	0	Mus 125 Ensemble (Major)	1
Mus 351 Teaching of Sec. Choral Music**	2	Mus 254-257 Instrumental Methods*	2
Mus 352 Teaching of Sec. Instr. Music	2	Mus 400 Applied Performance (Major)	2
Mus 400 Applied Performance (Major)	2	Mus 401 Recital	0
Ed 382 Intern Teaching	11	Ed 381 Professional Practicum***	4
		Core Requirements	9
	17		18

*Student elects two of four instrumental methods courses.
**Accelerated courses.
***Credited from seventh semester.

MUS 011. FUNCTIONAL GUITAR **No credit**
Class instruction in guitar. Required for all choral, elementary, or general music specialists. Competency must be passed through examination before eligibility to upperclass status. Class meets two hours per week.

MUS 100-400. APPLIED PERFORMANCE **One credit or two credits**
Instruction offered in all keyboard, band and orchestral instruments, guitar and voice. Individual instruction. For non-music and music majors. Each area conducts a weekly master class for discussion and performance. Participation is required.

Prerequisite: Consent of instructor.

MUS 100. Freshman Level
MUS 200. Sophomore Level
MUS 300. Junior Level
MUS 400. Senior Level
MUS 301. Junior Recital — No credit
MUS 401. Senior Recital — No credit

Section A	Flute	Section M	Violin
Section B	Clarinet	Section N	Viola
Section C	Oboe	Section O, U, V, W	Piano
Section D	Bassoon	Section P	Cello
Section F	Saxophone	Section Q	Bass
Section G	Trumpet	Section R	Percussion
Section H	French Horn	Section S, T	Voice
Section I	Baritone Horn	Section X	Organ
Section J	Trombone	Section Y	Guitar
Section L	Tuba	Section Z	Harp

MUS 101. INTRODUCTION TO MUSIC I **Three credits**
The materials of music and their interrelationships. Illustrations are derived from literature of all periods for the purpose of developing understanding and enjoyment through perceptive listening.

MUS 102. INTRODUCTION TO MUSIC II **Three credits**
A survey of performance literature extending from the 17th century to the present. Directed listening of various idioms, forms, and styles characteristic of each period. The purpose is to stimulate critical judgment.

Prerequisite: Mus 101 or consent of instructor.

MUS 103-104, 203-204 COMPREHENSIVE MUSICIANSHIP I-IV **Two credits**
A degree requirement. Intensive training in basic skills through ear-training, rhythmic, melodic and harmonic dictation, keyboard harmony, and aural analysis using modal, tonal and post-tonal compositions. Competency must be demonstrated before entrance into the junior class.

Corequisite: To be taken in sequence with Harmonic Foundations and the Analysis of Music.

MUS 105-106, 205-206. HARMONIC FOUNDATIONS I-IV **Three credits**
A degree requirement. A study of the functions, structures, and elements of music, modal through post-tonal styles. Written exercises and in-depth examination of musical examples.

Corequisite: To be taken in sequence with Comprehensive Musicianship and the Analysis of Music.

MUS 107-108, 207-208. ANALYSIS OF MUSIC I-IV **Three credits**
A degree requirement. In-depth studies of the historical evolution of musical styles, antiquity to the present, through class lectures, analysis of the literature, and performance practices.

Corequisite: To be taken in sequence with Comprehensive Musicianship and Harmonic Foundations.

MUS 111-112. CLASS PIANO I-II **Two credits**
Class instruction in piano. A two-semester sequence designed to provide non-music majors with a rudimentary study of piano performance. The classes will be divided into small sections according to proficiency level.

Prerequisite: None.

MUS 121. WIND ENSEMBLE **One-half credit**
Open to all members of the College community, by audition. A select organization of wind, brass, and percussion players that performs the best of the tradition Concert Band repertory, along with contemporary music for wind ensemble.

MUS 125. CHORUS **One-half credit**
The Chorus offers students the opportunity to learn and perform a wide range of sacred and secular choral music. Open to all college students. Anyone desiring to sing in the chorus should consult with the director. Participation required of all music majors.

MUS 126. CAP AND BELL SINGERS **One-half credit**
Membership is limited to a small group of selected singers who learn and perform solo and ensemble pieces from the literature of opera, operetta, and musical theatre.

MUS 127. JAZZ ENSEMBLE **One-half credit**
Open to all members of the College community, by audition. The ensemble rehearses and presents frequent performances of literature encompassing a wide range of jazz styles and techniques.

MUS 128. CHAMBER PERFORMANCE **One credit**
Participation required of all applied performance majors for a minimum of three semesters. Students will study and publicly perform chamber literature appropriate to their instruments. Coaching and supervision by faculty members, as assigned.

Prerequisites: Mus 200, junior standing, or consent of instructor.

MUS 131. COLLEGE ORCHESTRA **One-half credit**
Open to all members of the College community, by audition. The orchestra performs concerts throughout the year of chamber and symphonic literature. Participation is required of all string applied performance and string music education majors.

MUS 203-204. See Mus 103-104.

MUS 205-206. See Mus 105-106.

MUS 207-208. See Mus 107-108.

MUS 212. KEYBOARD ACCOMPANYING **Two credits**
A study of the techniques concerned with solo, chamber, and group accompanying. Required of all keyboard applied performance majors.

Prerequisites: Mus 101, 103-106.

MUS 213-215. ACCOMPANYING PRACTICUM I-III **One credit**
Practical accompanying experience, as assigned. Minimum time allotment is five hours per week of studio, chamber, or group accompanying, plus public performance accompanying when required.

Prerequisite: Mus 212.

MUS 250. TEACHING OF ELEMENTARY MUSIC **Two credits**
A study of the newer practices in elementary music — Suzuki, Orff, Kodaly, and Dalcroze. Emphasis on the development of skills and techniques of physical movement, improvisation,

solfeggio, tone-bar and mallet technique, recorder playing, folk dancing, composition of suitable materials for classroom use, arranging and adapting existing music for the Orff instrumentarium. A survey and evaluation of appropriate resource materials.

MUS 252. TEACHING OF GENERAL MUSIC **Two credits**

A study of the contemporary approaches to teaching of general music in junior and senior high schools, such as creativeness and musical skill concepts through an extension of Orff, Kodaly, and others.

Prerequisite: Mus 250.

MUS 254-258. MUSIC METHODS **Two credits**

An examination, discussion and practical application of the methodology necessary for the students to learn the techniques of group performance in the principal instrumental and vocal areas. This sequence of courses provides the student with a minimum competency in the group performance techniques of each instrumental idiom. This exposure reinforces the technical concentration beyond the student's major applied instrument. Required of all music education students.

MUS 254. Woodwinds Methods
MUS 255. Brass Methods
MUS 256. String Methods
MUS 257. Percussion Methods
MUS 258. Vocal Methods

Prerequisites: Mus 100, 103-106, sophomore standing, or consent of instructor.

MUS 259. VOICE DICTION **Two credits**

An intensive study of the phonics of English, French, German, and Italian languages, based upon the International Phonetic Alphabet. Practical application is achieved through song literature selected from all historical periods. Required of all voice performance and choral music education majors.

MUS 260-264. CONDUCTING I-III **Two credits**

Through class lectures, demonstrations and laboratory performances, students learn and practice the fundamental techniques of conducting. Score reading and preparation, basic conducting patterns, gestures, and rehearsal methodology will be studied. The emphasis will be on actual laboratory experience.

MUS 260. Introduction to Conducting
MUS 261. Choral Conducting II
MUS 262. Instrumental Conducting II
MUS 263. Advanced Choral Conducting III
MUS 264. Advanced Instrumental Conducting III

Prerequisites: Mus 103-108, sophomore standing, or consent of instructor.

MUS 298. TOPICS **Three credits**

A study in topics of special interest not extensively treated in regularly offered courses.

MUS 305. COMPOSITION AND ORCHESTRATION **Two credits**

Practical exercises in composition, orchestration, and arranging for instruments and voices in all combinations, including orchestral, wind, jazz, and chamber ensembles.

Prerequisites: Mus 206 and 208.

MUS 306. 20th CENTURY THEORY **Two credits**

A survey of twentieth-century theoretical systems emerging from post-romantic and impressionistic to post-serial and avant-garde styles of the contemporary times. Emphasis will be on compositional techniques. Works and writings of Schoenberg, Stravinsky, Hindemith, Babbitt, Sessions, Messaien, Boulez, and others will be examined. Listening and analysis.

Prerequisites: Mus 204, 206, and 208, junior standing, or consent of instructor.

MUS 307-316. MUSIC PEDAGOGY **Three credits**

A survey of the techniques and methodology concerned with individual teaching of each applied idiom. Required of all applied performance majors. Sections are offered in the following areas:

MUS 307. Voice Pedagogy
MUS 309. Piano Pedagogy
MUS 311. Woodwind Pedagogy
MUS 313. Brass Pedagogy
MUS 315. String Pedagogy
MUS 316. Percussion Pedagogy

Prerequisites: Mus 200, junior standing, or consent of instructor.

MUS 351. TEACHING OF SECONDARY CHORAL MUSIC **Two credits**

An examination of the administration and logistics of a secondary choral music program. A systematic development of teaching and rehearsal techniques, planning, and evaluation.

Prerequisites: Mus 250, 252, 260 and 261, junior standing, or consent of instructor.

MUS 352. TEACHING OF SECONDARY INSTRUMENTAL MUSIC **Two credits**

An examination of the administration and logistics of a secondary instrumental music program. A systematic development of teaching and rehearsal techniques, planning, and evaluation.

Prerequisites: Mus 250, 252, 260 and 262, junior standing, or consent of instructor.

MUS 395-396. INDEPENDENT RESEARCH **One to three credits**

Independent study and research for advanced students in music under the direction of a staff member. A research paper at a more substantial level beyond a term paper is required.

Prerequisite: Approval of department chairperson.

MUS 397. SEMINAR **One to three credits**

Presentation and discussion of selected topics.

Prerequisite: Approval of department chairperson.

MUS 399. COOPERATIVE EDUCATION **Three or six credits**

Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)

Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

MUS 407-415. MUSIC LITERATURE **Three credits**

An examination of the literature, its style and technical problems, studied through performance coaching. These courses are designed to give the student a comprehensive knowledge of the literature for each respective major area of performance. They will provide a necessary foundation for performance practice requirements beyond the scope of only a lecture approach. Sections are offered in the following areas:

MUS 407. Voice Literature
MUS 408. Choral Literature
MUS 409. Keyboard Literature
MUS 410. Chamber Literature
MUS 411. Orchestral Literature
MUS 412. Woodwind Literature
MUS 413. Brass Literature
MUS 414. String Literature
MUS 415. Percussion Literature

Prerequisites: Mus 205-208, senior standing in music, or consent of instructor.

NURSING

Associate Professor Kolanowski, Chairperson; Associate Professors Castor, Druffner, Grabo, Saueraker, Schreiber, Steelman, Telban, Zack; Assistant Professors Crowley, Gunderman, Kaminski, Merrigan, Notarianni, Sheer, Ward, Zielinski; Visiting Assistant Professor Bantell; Adjunct Faculty Babcock, Craig; Russin, Director of Nursing Learning Laboratory.

Total minimum number of credits required for a major in Nursing leading to the B.S. degree — 130.

Philosophy and Curriculum

The practice of professional nursing is a deliberative process of assessing, analyzing, planning, implementing, and evaluating care with clients which promotes and restores health and prevents illness. The baccalaureate program prepares a beginning, self-directed practitioner who is capable of initiating, implementing, and revising nursing care.

Professional nursing is based upon the integration of knowledge from the humanities, the physical and social sciences, nursing theories and research. The curriculum is based on the development of the individual throughout the life cycle.

The curriculum flows from the philosophy and covers a four-year academic period. It includes integrated nursing courses, electives and the general core requirements. Written agreements with the cooperating hospitals and agencies in Northeastern Pennsylvania ensure clinical facilities for the student's practice, which is concurrent with the classroom theory. Cooperating agencies which are used for student practice are listed in the Nursing Student Handbook. **(STUDENTS ARE RESPONSIBLE FOR THEIR OWN TRANSPORTATION TO ASSIGNED CLINICAL AREAS.)**

In addition, opportunities for learning are provided in the Nursing Learning Center, which is equipped with electronic study carrels and audio-visual instructional materials. A simulated hospital environment allows the student to practice the psychomotor skills necessary in nursing practice. A faculty member is available to assist the students.

Advanced Placement

The Department of Nursing provides advanced credit examinations for applicants to enter the program at their level of competency. Previous education and/or practical experience which would involve repetitive learning justify advancing the applicant to higher level responsibilities.

Transfer and registered nurse students are required to have a personal interview with the department chairperson or her designee to plan their program before they can be accepted into the Wilkes nursing program.

Registered nurse students and students who have completed a program of study and are eligible to sit for NCLEX-RN are required to complete N299 and successfully pass a comprehensive examination for validation of prior learning. When these two requirements are met, credit will be awarded for N202, N203 and N204.

Specific Requirements for the Nursing Program

Students majoring in Nursing are required to have completed courses in English (4 units), Social Studies (three units), Mathematics (two units including Algebra), and Science (two units including Biology and Chemistry) during their secondary school program.

The student of nursing assumes all the financial obligations listed in the section on fees in this Bulletin. Additional expenses incurred in the nursing program are listed in the Nursing Student Handbook. A price list for the above items may be obtained at the Department of Nursing.

Students must obtain from the Department Secretary, early each May, the appropriate health examination forms to be completed and returned to the Department of Nursing by August 1st. Students should read the form carefully and be sure it is completed before returning it. Failure to have all examinations completed and documented by August 1st results in a $25 late fee.

Nursing courses are introduced in the sophomore year. Satisfactory clinical performance is an essential component of each nursing course. A grade of 2.00 is required in **all** clinical nursing courses to progress through the program. A student may repeat one nursing course without prejudice. A subsequent failure of any clinical nursing course is deemed sufficient cause for dismissal from the program.

A student may be required to submit, at any time, to a health evaluation by the University physician, or nurse practitioner, if evident limitations interfere with the student's practice or learning.

In addition to fulfilling the academic requirements of the University, students majoring in nursing are required to successfully complete the comprehensive examination administered by the Department of Nursing before being eligible to graduate.

License to Practice

Candidates for a license to practice in the health field are required to have "good moral character." The Pennsylvania State Board of Nursing takes into consideration, when deciding on the applications for registration and a license to practice under their jurisdiction, whether candidates have been included in any legal action or legal proceedings, either civil or criminal.

Any candidate for licensure who has been convicted of, pleaded guilty to, or entered a plea of nolo contendere to a felonious act prohibited by the act of April 17, 1972 (P.L. 233, No. 64), known as "The Controlled Substance, Drug, Device and Cosmetic Act" shall not sit for the licensing examination for a period of 10 years from the time of conviction and may need to satisfy other requirements as specified by the State Board of Nursing in Pennsylvania. Students should also note that a person convicted of any felonious act may be prohibited from licensure by the Board of Nursing at any time.

THE DEPARTMENT OF NURSING FACULTY RESERVES THE RIGHT TO REVISE THE NURSING MAJOR REQUIREMENTS AS DEEMED NECESSARY AT ANY TIME TO PREPARE STUDENTS FOR NEW AND EMERGING ROLES IN NURSING.

Recommended Course Sequence for a Major in Nursing

First Semester		Second Semester	
Bio 115 Human Anatomy and Physiology I	4	Bio 116 Human Anatomy and Physiology II	4
Chm 111 Intro. to Chemical Reactions and Principles	4	Chm 130 Organic and Biological Chemistry	4
Eng 101 Composition I	3	Eng 102 Composition II	3
Psy 101 General Psychology or Soc 101 Intro. to Sociology or Ant 101 Intro. to Anthropology*	3	Psy 101 General Psychology or Soc 101 Intro. to Sociology or Ant 101 Intro. to Anthropology*	3
PE 100 Activity	0	Core Requirement or Soc 275	3
CST 101 Core Studies I	1	PE 100 Activity	0
	15	Mth Competency**	0
			17

Third Semester		Fourth Semester	
Bio 113 Microbiology	4	Nsg 202 Nursing Care of the Young Client	8
Nsg 200 Nutrition	3	Mth 150 Elementary Stats or Core Requirement***	3
Nsg 201 Introduction to Nursing	6	Psy Elective	3
Soc 275 Sociology of Minorities or Core Requirement	3	Core Requirement	3
	16		17

Fifth Semester		Sixth Semester	
Nsg 203 Nursing Care of the Adult Client	8	Nsg 204 Nursing Care of the Adult Client II	8
Mth 150 Elementary Stats or Core Requirement**	3	Core Requirement	3
Elective	3	Core Requirement or Elective	3
	14	Core Requirement or Elective	3
			17

Seventh Semester		Eighth Semester	
Nsg 301 Nursing Care of the Older Adult Client	8	Nsg 302 Senior Practicum	8
Nsg 303 Contemporary Issues in Nursing or Elective/Core	3	Nsg 303 Contemporary Issues in Nursing or Core Requirement	3
Nsg 305 Intro. to Nursing Research	3	Elective	3
Elective	3	Elective	3
	17		17

*Please note students must take both Psy 101 and Soc/Ant 101 during their freshman year.
**Math competency must be obtained during the freshman year. It is a prerequisite to Nsg 201.
***Please note: Math 150 is required and prerequisite to Nsg 305.

NSG 200. PRINCIPLES OF NORMAL NUTRITION **Three credits**
An introduction of the basic science of human nutrition; principles of normal nutrition, meal planning, computation of diets, physiological, psychosocial, and social effects of food and its constituents; and some contemporary local, national, and international nutrition problems.
Prerequisite: Chm 130.
Corequisite: Nsg 201.

NSG 201. INTRODUCTION TO NURSING **Six credits**
This course introduces the concepts of client, basic human needs, accountability, development, health status, nursing process, nursing leadership, and research. Use of the nursing process is emphasized in meeting the basic health care needs of clients. Instruction in the Nursing Learning Center and selected clinical agencies constitutes the laboratory component. Hours weekly: 4 hours class, 1 hour discussion, 3 hours clinical practice. Placement: third semester. Fee: $75.
Prerequisites: Bio 116, Chm 130, Psy 101, Soc 101, Mth competency.
Corequisites: Nsg 200, Bio 113, Soc 275.

NSG 202. NURSING CARE OF THE YOUNG CLIENT **Eight credits**
Basic concepts introduced in Nsg 201 are utilized in assisting young clients to meet their health needs during childbearing and childrearing years. Theory is concurrent with practice in select health care settings including community agencies. Hours weekly: 4 hours class, 12 hours clinical practice. Fee: $75.
Prerequisites: Nsg 201, Nsg 200 and Bio 113.

NSG 203. NURSING CARE OF THE ADULT CLIENT I **Eight credits**
The nursing process is utilized in assisting adult clients to maintain optimum wellness and to resolve selected health problems. Nursing theory as related to the biopsychosocial aspects of adult care is correlated with clinical practice in a variety of health care settings. Continuity of care is emphasized in the clinical component. Relevant findings from nursing research are incorporated. Hours weekly: 4 hours class, 12 hours clinical practice. Fee: $75.
Prerequisite: Nsg 202.

NSG 204. NURSING CARE OF THE ADULT CLIENT II **Eight credits**
The nursing process is utilized in assisting adult clients to maintain optimum wellness and to resolve selected medical, surgical, and mental health problems. Nursing theory as related to the biopsychosocial aspects of adult care is correlated with clinical practice in a variety of health care settings. Continuity of care is emphasized in the clinical component. Relevant findings from nursing research are incorporated. Hours weekly: 4 hours class, 12 hours clinical practice. Fee: $75.
Prerequisite: Nsg 203.

NSG 270. RECENT TRENDS IN CLINICAL NUTRITION **Three credits**
This elective course is an introduction to diet therapy, with a discussion of the contemporary issues in clinical nutrition. Deals with the popular myths about nutrition and health and substantiates or refutes these claims with research evidence.
Prerequisite: Nsg 200 or RN status.

NSG 271. HEALTH CARE TERMINOLOGY **One credit**
Word derivations, roots, prefixes, and suffixes are studied in an attempt to enable students to understand and communicate in terminology common to the health care professions. The emphasis will be on understanding the language in context rather than memorization of unrelated terms.

NSG 272. CLINICAL APPLICATION OF PHARMACOLOGY **Three credits**
This elective course is designed to expand the student's knowledge of pharmacology. It includes the pharmocologic effect of drugs on body systems, as well as the interaction of multiple drugs and environmental factors.
Prerequisites: Junior and Senior Nursing students and Registered Nurses.

NSG 299. NURSING FORUM I **Six credits**

This course is designed to facilitate the transition of Registered Nurse students from other educational routes into baccalaureate nursing education. The course explores the concepts of client basic human needs, development, accountability, health status, nursing process, nursing leadership and research. Use of the nursing process is emphasized in assisting a variety of clients to maintain optimum level wellness. Nursing theory as related to the biological, psychological, and social aspects of client health is correlated with clinical practice in a variety of health care settings. Hours weekly: 5 hours class, 3 hours clinical practice. Fee: $75.

Prerequisites: RN status or NCLEX eligibility, Eng 101-102.

NSG 301. NURSING CARE OF THE OLDER ADULT CLIENT **Eight credits**

The nursing process is utilized in the care of the older adult client. Topics have been chosen which reflect the normative changes accompanying the aging process as well as the interactive effects of multiple biological, psychological, and social problems. Clinical practice, emphasizing disease prevention, health promotion, maintenance and restoration, in long-term care settings, is correlated with theory presentation. Hours weekly: 4 hours class, 12 hours clinical practice. Fee: $75.

Prerequisite: Nsg 204.

NSG 302. SENIOR PRACTICUM **Eight credits**

Explores current nursing theories and models of practice, and develops the concepts of leadership, management, and organizational change. The student synthesizes knowledge from all previous nursing and supportive courses in an area of clinical practice consistent with career goals and contingent upon availability of clinical placement and approval of the Level Coordinator. Hours weekly: 2 hours class, 18 hours clinical practice in a variety of settings. Fee: $75.

Prerequisites: Nsg 301 and Nsg 305.

NSG 303. CONTEMPORARY ISSUES IN NURSING **Three credits**

This course examines the influences on the role and functioning of the professional nurse. Current issues and long-term trends are analyzed for their effects on nursing and health care. The nursing profession is studied, using formats which foster critical thinking and communication skills. Major emphasis is placed on nursing as an independent health-care profession; interdependent and collaborative relationships with other health professions are also examined.

Prerequisite: Nsg 204.

NSG 305. INTRODUCTION TO NURSING RESEARCH **Three credits**

This course is a foundation for the study of nursing problems. It will be useful in planning and implementing small research studies, critically reading research reports, and applying research findings to practice.

Prerequisites: Nsg 204, Mth 150.

NSG 307. PHYSICAL ASSESSMENT **Three credits**

This elective course is designed to facilitate the integration of physical assessment skills as an essential element of the nursing process. The components of physical assessment, including the health history and physical examination, are organized to allow the student to proceed from an assessment of the overall functions of a client to the more specific functions of each body system. The evaluation of the health status of individuals is expanded to include more complex assessment skills as well as modifications for the elderly and pediatric client.

Prerequisites: Junior and Senior Nursing majors or RN students.

NSG 395-396. INDEPENDENT STUDY **One to three credits**

Independent study for advanced students in nursing under the direction of a staff member.

Prerequisites: By arrangement with an instructor. Candidates for independent study must have a minimum cumulative and nursing G.P.A. of 3.00 and be of senior class standing.

NSG 399. COOPERATIVE EDUCATION **Three or six credits**

Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)

Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

NSG 198/298/398. TOPICS IN NURSING **Variable credit**

A study in topics of special interest that are not exclusively treated in regularly offered courses.

PHILOSOPHY

Professor Kay, Chairperson; Professor Emeritus Williams; Assistant Professors Jacoby, Paul.

Total minimum number of credits required for a major in Philosophy leading to the B.A. degree — 121.
Total minimum number of credits required for a minor — 18.

The study of philosophy, whether by those who pursue a major in philosophy or by those who elect only a few courses of special interest, contributes to the development of the most basic skills and habits of mind which are characteristic of educated men and women: clarity of thought, precision in the analysis of conflicting claims, the power to render sound judgments based upon an appreciation of differing perspectives, and the ability to express and defend one's own views with force and imagination. Students who develop these skills through the study of philosophy are prepared for a variety of professional careers in law, medicine, teaching, and the ministry. In addition, they are the beneficiaries of the traditional liberal arts education as a preparation for numerous careers in government, business, and industry.

Since students may elect to pursue a double major in philosophy and a related area of interest, philosophy majors are invited to design their own majors in consultation with their advisors and with the approval of the department chairperson. The typical program consists of 30 credit hours in philosophy, including either Phl 101 or Phl 201, and Phl 152.

The minor in philosophy consists of 18 credit hours, including Phl 101 (3 credit hours), Phl 152 (3 credit hours), and at least one course from Phl 201 through Phl 206 (3 credit hours).

Recommended Course Sequence for a Major in Philosophy

First Semester		Second Semester	
Eng 101 Composition I	3	Eng 102 Composition II	3
Core Requirements	12	Core Requirements	12
CST 101 Core Studies I	1	PE 100 Activity	0
PE 100 Activity	0		15
	16		

Third Semester		Fourth Semester	
Phl 101 Introduction to Philosophy	3	Phl 152 Introduction to Logic	3
Core Requirements	6	Core Requirement	3
Free Electives	6	Free Electives	9
	15		15

Fifth Semester		Sixth Semester	
Major Electives	6	Major Electives	6
Free Electives	9	Free Electives	9
	15		15

Seventh Semester		Eighth Semester	
Major Electives	6	Major Electives	6
Free Electives	9	Free Electives	9
	15		15

PHL 101. INTRODUCTION TO PHILOSOPHY **Three credits**
An introduction to the major figures, problems, and concerns of Western philosophical thought. Students in this course typically examine a variety of philosophical questions and problems, such as the existence of God; human nature and the good life; fatalism, freedom, and responsibility; skepticism and the nature of knowledge; and theories of reality.

PHL 152. INTRODUCTION TO LOGIC **Three credits**
An introduction to the principles of deductive reasoning. The recognition of fallacies; general rules of inference; distinguishing good and bad arguments; the use and abuse of language; and the application of logical principles to related disciplines.

PHL 201. ORIGINS OF WESTERN THOUGHT: SOCRATES TO AUGUSTINE **Three credits**
The development of Western philosophical thought from its beginnings in the Greek world to Christian thought in the Middle Ages. Special attention will be focused upon the writings of the Pre-Socratics, Plato, Aristotle, Plotinus, Aquinas, Duns Scotus, William of Ockham, and Augustine.

PHL 202. MODERN PHILOSOPHY: DESCARTES TO KANT **Three credits**
Western philosophical thought from the Renaissance to the end of the eighteenth century, including the writings of Descartes, Spinoza, Leibniz, Locke, Berkeley, Hume, and Kant.
Prerequisite: Phl 101 or 201.

PHL 203. NINETEENTH CENTURY PHILOSOPHY **Three credits**
An examination of the writings of the major English and European philosophers in the nineteenth century, including the works of Fichte, Schopenhauer, Mill, Kierkegaard, Nietzsche, McTaggart, Bradley, and Marx.
Prerequisite: Phl 101 or 201.

PHL 204. TWENTIETH CENTURY PHILOSOPHY **Three credits**
Major figures and movements in contemporary philosophical thought, with special emphasis upon English philosophy since 1900. Major philosophers to be studied include Moore, Russell, Ayer, Wittgenstein, Bergson, Husserl, Heidegger, and Sartre.
Prerequisite: Phl 101 or 201.

PHL 206. AMERICAN PHILOSOPHY **Three credits**
A survey of the distinctively American contributions to philosophical thought, from Jonathan Edwards to the present. Included in the course is an examination of major influences in American thought, such as realism, idealism, and pragmatism, as well as a study of major figures such as Santayana, Royce, Peirce, James, Dewey, Whitehead, Hocking, Quine, and others.
Prerequisite: Phl 101 or 201.

PHL 210. ETHICS **Three credits**
A study of the values, ideals, and ideologies which comprise the foundations of human conduct. Several major ethical theories will be examined, e.g., egoism, altruism, and utilitarianism, along with a number of ethical problems such as moral skepticism, relativism, the concept of authority, and the role of facts in ethical theory. The application of ethical theory to specific human problems such as racism and sexism, homosexuality, political corruption, punishment, violence, and drug abuse is also examined.
Prerequisite: Phl 101 or 201.

PHL 214. MEDICAL ETHICS **Three credits**
An inquiry into the ethical issues which underlie the practice of medicine. Classical ethical theories such as those of Plato, Hume, Kant, and Mill are examined in a context involving such medical problems as: patients' rights, genetic counseling, abortion, human experimentation, elective death, birth defects, and the limits of lifesaving therapy.
Prerequisite: Phl 101 or 201.

PHL 216. PHILOSOPHY OF ART **Three credits**
An examination of the nature of artistic creativity, imagination, perception, and expression as such notions arise in the literary arts of fiction and poetry, the visual arts of painting, photography, motion pictures, and television, and the performing arts of drama, music, and dance. Emphasis will also be placed upon the development of at least one major theory of art, such as that of Plato, Aristotle, Kant, Dewey, or Collingwood.
Prerequisite: Phl 101 or 201.

PHL 220. PHILOSOPHY OF RELIGION **Three credits**
An examination of various problems that arise when religion is made the object of philosophical reflection. The nature and forms of religious experience; the relationship between faith and reason; arguments for the existence of God; the problem of evil; arguments for immortality; the concepts of worship and miracle; the nature of religious language; and the possibility of religious knowledge.
Prerequisite: Phl 101 or 201.

PHL 225. LITERATURE OF THE OLD TESTAMENT **Three credits**
The course aims at giving students an insight into the books of the Old Testament and the range and depth of the religious heritage received from Israel. The biblical message is studied in its dynamic context of the culture, geography, and history of the ancient Near East.
Prerequisite: Phl 101 or 201.

PHL 226. LITERATURE OF THE NEW TESTAMENT **Three credits**

An examination of the form and content of the books of the New Testament as literary products and as records of the faith that gave rise to the Christian Church. The teachings of Jesus and the Apostolic Church are studied against the background of their own time and examined in their significance for contemporary life.

Prerequisite: Phl 101 or 201.

PHL 228. CONTEMPORARY RELIGIOUS THOUGHT **Three credits**

A study of the development of religious thought from neoorthodoxy to the "Death of God" theologies. The impact of scientism, linguistic philosophies, and ecumenism on modern theologizing; the thinkers whose views will be considered include Barth, Brunner, the Niebuhrs, Bultmann, Farmer, Weiman, Maritain, Buber, Sartre, Heidegger, Tillich, Rahner, Rubenstein, Altizer, Cox, Brown, and Weigel.

Prerequisite: Phl 101 or 201.

PHL 230. SOCIAL AND POLITICAL PHILOSOPHY **Three credits**

Social and political institutions as seen by such classical critics as Plato, Aristotle, Hobbes, Hume, Burke, Bentham, and others. Special attention to analysis of the problems of censorship, relation of church and state, prejudice, aims and methods of democratic institutions.

Prerequisite: Phl 101 or 201.

PHL 232. PHILOSOPHY OF HISTORY **Three credits**

A study of the various interpretations of history. The views of Augustine, Vico, Rousseau, Kant, Hegel, Marx, Comte, Spengler, Schweitzer, Toynbee, Sorokin, Niebuhr, and others on the meaning of historical events.

Prerequisite: Phl 101 or 201.

PHL 240. PROBLEMS IN METAPHYSICS **Three credits**

A critical examination of one or more problems of ontology and cosmology as dealt with by both classical and contemporary metaphysicians. Problems to be considered may include the concepts of substance, existence, causality, God, space and time, the problem of change and motion, free will and causal determinism, fatalism, the relationship between mind and body, and the nature of universals.

Prerequisite: Phl 101 or 201.

PHL 298. TOPICS **Three credits**

The study of a topic of special interest not extensively treated in other courses. Possible topics include philosophy of law; philosophy of biology; technology and value; philosophy of death; philosophy of literature; etc.

Prerequisite: Phl 101 or 201.

PHL 301. STUDIES IN GREEK PHILOSOPHY **Three credits**

A critical examination of a single major philosopher or text in the period of classical Greek philosophy. Variable content: this course may be repeated for credit. Normally preceded by Phl 201.

Prerequisite: Phl 101 or 201.

PHL 302. STUDIES IN MODERN PHILOSOPHY **Three credits**

A critical examination of a single major philosopher or text in the modern period from Descartes to Kant. Variable content: this course may be repeated for credit. Normally preceded by Phl 202.

Prerequisite: Phl 101 or 201.

PHL 310. STUDIES IN MORAL PHILOSOPHY **Three credits**

A critical inquiry into the development of a rational ethical theory. The ethics of Plato, Aristotle, Hume, Kant, and Mill are examined along with the analytical, existential, and normative

extensions of these theories in contemporary ethical thinking. The role which such important ethical concepts as virtue, justice, responsibility, and happiness play in structuring a sensible moral philosophy is examined in depth. Normally preceded by Phl 210.

Prerequisite: Phl 101 or 201.

PHL 320. ADVANCED PHILOSOPHY OF RELIGION **Three credits**

An intensive examination of a major problem or figure in the philosophy of religion. Variable content: course may be repeated for credit. Normally preceded by Phl 220.

Prerequisite: Phl 101 or 201.

PHL 350. PHILOSOPHY OF SCIENCE **Three credits**

A critical examination of the nature of science; meaning, verifiability, and experimentation in the sciences; the principle of verifiability in physics and psychology; induction and the various interpretations of probability; causality and laws of nature; and the nature of explanation and justification.

Prerequisite: Phl 101 or 201.

PHL 352. SYMBOLIC LOGIC **Three credits**

A review of the propositional calculus and a thorough examination of the predicate calculus, including identity, definite descriptions, and relations. Emphasis will be placed upon the concept of a formal system and axiomatization, as well as properties of deductive systems such as consistency, completeness, independence of axioms, and other formal properties.

Prerequisite: Phl 152 or Mth 202 or permission of instructor.

PHL 360. EXISTENTIALISM **Three credits**

A close examination of the literature of the major existentialist writers, both theistic and atheistic, together with a consideration of its impact upon philosophy, religion, psychology, and art. Special attention will be given to the thought of Kierkegaard, Nietzsche, Jaspers, Heidegger, Marcel, and Sartre.

Prerequisite: Phl 101 or 201.

PHL 395-396. INDEPENDENT RESEARCH **One to three credits**

Independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.

Prerequisite: Approval of department chairperson is required.

PHL 397. SEMINAR **One to three credits**

Presentations and discussions of selected topics.

Prerequisite: Approval of department chairperson is required.

PHL 399. COOPERATIVE EDUCATION **Three or six credits**

Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)

Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

PHYSICAL EDUCATION

Assistant Professor Wingert, Chairperson; Professor Reese; Associate Professors Saracino, Schmidt; Assistant Professor Meyers; Coaches DeMelfi, Kest, Malatesta, Rainey; Trainer, Aed.

Physical education is an integrated part of the total educational program at Wilkes University. It is designed to help the student understand and practice knowledge of body movement. The aim of the Physical Education Program is to provide each student with opportunities to participate in physical activities that will satisfy his/her needs, interests, and physical fitness goals.

Students are required to complete two semesters of Physical Education, each semester being a different learning experience. It is recommended that students fulfill their two semesters of Physical Education in the first two years of their program. The only exceptions to this requirement are made to veterans of the military service and to students who have medical excuses which are submitted to and verified by the University Infirmary and the Registrar. Veterans should submit a copy of their honorable discharge from the service to the Registrar's Office.

Students enrolled in AFROTC may substitute AS 101-102-201-212 for the PE 100 series.

PE 101. INTERCOLLEGIATE ATHLETICS — No credit
This course is limited to students participating in intercollegiate athletics, cheerleaders, majorettes, and strutters during their sport season. This course may be repeated.

PE 115. BODY MECHANICS AND WEIGHT TRAINING – WOMEN — No credit
Individual weight training programs are developed. Body form and fitness levels are evaluated. This course provides instruction in the basic techniques of free weights.

PE 116. WEIGHT TRAINING — No credit
Individual weight training programs are developed. This course provides instruction in techniques of free weights.

PE 120. BEGINNING BOWLING — No credit
Designed to teach the basic techniques of bowling; grip, stance, footwork, delivery, and approach to foul line, release and follow through, rules and scorekeeping procedures.

PE 121. ADVANCED BOWLING — No credit
Designed for students who have developed fundamental bowling skills and now want to develop style of delivery, methods of aiming, rules, and team concepts.
Prerequisite: PE 120 or approval of instructor.

PE 125. BEGINNING BADMINTON — No credit
This course provides instruction in the fundamental skills of badminton with emphasis on play, rules, and strategy.

PE 126. ADVANCED BADMINTON — No credit
Designed for students who have developed the fundamental skills of the sport. The student should be able to apply the rules and basic strategy to tournament competition.
Prerequisite: PE 125 or approval of instructor.

PE 130. AEROBIC DANCE — No credit
This course is designed to develop cardiorespiratory conditioning, muscle tone, and other elements of fitness through dance and exercise movements performed to music.

PE 131. MODERN DANCE — No credit
This course is a study of contemporary dance technique and composition. Students will have experience in basic or axial and locomotive movement and explore movement in space, time, and energy-release.

PE 132. FOLK & SOCIAL DANCE — No credit
This course presents a variety of folk and social dances enjoyed by people of all cultures. Preservation of cultural heritage and social interaction are provided through participation.

PE 135. AEROBIC FITNESS — No credit
Group program for students to achieve aerobic fitness.

PE 136. FITNESS ACTIVITIES – JOGGING — No credit
This course is designed to develop a self-styled jogging program. Emphasis on warm-up, individual jogging, and cool-down.

PE 140. BEGINNING GOLF — No credit
An appreciation of golf as a lifetime activity is stressed. Instruction of swing mechanics, rules, terminology, and safety practices taught. Weather permitting, outdoor practice of skills will be provided.

PE 145. INDOOR HOCKEY — No credit
Designed to teach fundamental skills of indoor hockey and to apply these skills in game situations.

PE 146. INDOOR SOCCER — No credit
Designed to teach the fundamental skills of soccer and to apply these skills in game situations.

PE 147. TEAM HANDBALL – MEN — No credit
Consists of six field players and a goalie. An aggressive game of throwing, jumping, running, offensive, and defensive moves that develop athletic skills and improve physical fitness.

PE 148. VOLLEYBALL & BASKETBALL – MEN — No credit
Elementary skills, terminology, mechanics of offensive and defensive movement, strategy, and rules are developed within team games.

PE 150. LEISURE-TIME GAMES — No credit
This course offers a variety of games for leisure-time enjoyment.

PE 155. TEAM SPORTS — No credit
Designed for group participation in team sports activities. Such activities as volleyball, basketball, touch football, or other sports activities may be included.

PE 160. RACQUETBALL — No credit
This course teaches fundamental skills of racquetball, strategy, and rules of play. Fee for course.

PE 165. SWIM INSTRUCTION — No credit
Water skills, safety, self-reliance, precautions are developed along with swimming stroke instruction.

PE 166. ADVANCED LIFE SAVING **No credit**

This course will be taught under the American Red Cross guidelines for lifeguard certification. All lifesaving water skills will be taught and all written and textbook work will be completed in the course.

Those completing and passing the course will not only receive PE credit but lifeguard certification as well. If students prefer only to learn lifesaving skills, they will not have to do the testing for certification. Also through this course the Advanced Life Saving Renewal Program is available.

PE 167. RECREATIONAL SWIM **No credit**

This course gives the skilled swimmers the opportunity to swim. Lap swimming and recreational water games are included. Fitness through swimming will be stressed.

PE 170. SKIING **No credit**

This course is designed to give students the opportunity to learn to ski and/or improve their skiing skills. Ski school lessons will be available for all levels of skiing ability. Fee for course.

PE 175. TENNIS INSTRUCTION **No credit**

Designed to teach fundamental skills, terminology, mechanics of offensive and defensive movements, strategy, and rules of play.

PE 180. BEGINNING VOLLEYBALL **No credit**

This course teaches the basic skills of volleyball. Serves, sets, bump passes, spikes, and rules of play are emphasized.

PE 181. ADVANCED VOLLEYBALL **No credit**

This course is designed for students who have developed fundamental skills for power volleyball. Offensive and defensive team play are stressed.

Prerequisite: PE 180 or approval of instructor.

PE 198. TOPICS IN PHYSICAL EDUCATION **No credit**

These courses are designed to meet specific needs of groups of students. The courses will be offered on a trial basis in order to determine demand and value of introducing them as part of the university curriculum.

PE 210. CONTEMPORARY HEALTH CONCEPTS **Two credits**

A study of present-day health concepts. The course undertakes to help students enjoy maximum health and happiness through a better understanding of themselves, their relationships with other people, and their functions within today's environment. Topics covered: chemical use and abuse, consumer health, diet and weight control, diseases, emotional and mental disorders, exercise and physical fitness, human sexuality, etc.

PE 310. TREATING ATHLETIC INJURIES **Three credits**

A course designed to provide experiences in application of various methods in treatment of athletic injuries. A study of preventive measures and medical management of athletic injuries. Experience in use of exercise techniques and physical modalities. Fee for course.

PE 315. EMERGENCY CARE TECHNIQUES **Three credits**

A course designed to provide experiences (both practical and theoretical) in the application of advanced first aid and emergency care techniques. The successful completion of the course will enable the student to render such care.

Prerequisite: Student must possess a **current** Cardiopulmonary Resuscitation (CPR) Card.

PE 399. COOPERATIVE EDUCATION **Three or six credits**

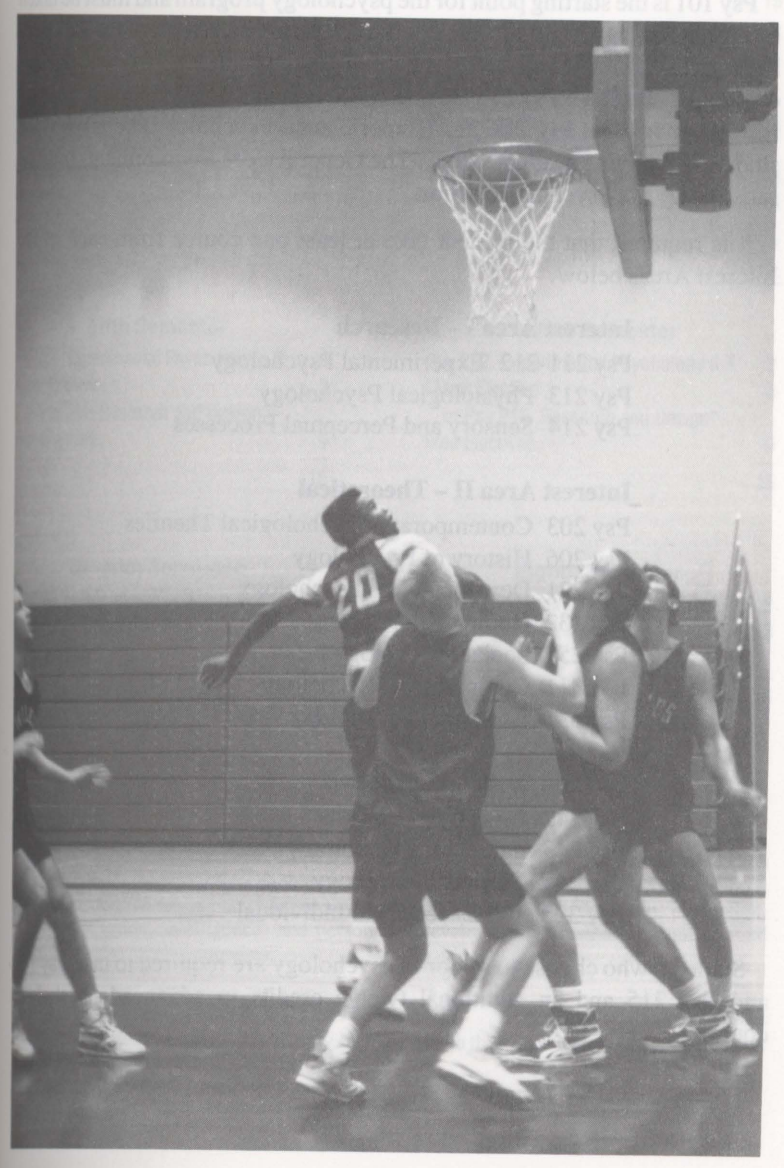
Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students

are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)

Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

PE 298/398. TOPICS IN PHYSICAL EDUCATION **Variable credit**

A study in topics of special interest not extensively treated in regularly offered courses. This course will be offered from time to time when interest and demand justify it.



PSYCHOLOGY

Professor Charnetski, Chairperson; Professors Bellucci, Riley; Associate Professors Bohlander, Stetten; Assistant Professor Adair; Adjunct Faculty Kanner.

Total minimum number of credits for a major in Psychology leading to the B.A. degree — 121.

Total minimum number of credits for a minor — 18.

Psy 101 is the starting point for the psychology program and must be taken by all psychology majors. This course does not count toward the 27 credit hours of psychology required of majors. In addition to Psy 101, the psychology major must take Psy 215 (Research Design and Analysis). It is strongly recommended that Psy 211-212 (Experimental Psychology) be taken if the student is planning graduate study. The General Core Requirements must be satisfied by the Psychology major.

It is required that the student take at least one course from each of the Interest Areas below.

Interest Area I – Research

Psy 211-212 Experimental Psychology
Psy 213 Physiological Psychology
Psy 214 Sensory and Perceptual Processes

Interest Area II – Theoretical

Psy 203 Contemporary Psychological Theories
Psy 206 History of Psychology
Psy 221 Developmental Psychology
Psy 232 Human Behavior
Psy 255 Social Psychology
Psy 311 Comparative Psychology
Psy 331 Abnormal Psychology

Interest Area III – Applied

Psy 242 Psychological Tests
Psy 243 Industrial Psychology
Psy 245 Clinical Psychology
Psy 325 The Exceptional Individual

Students who choose to minor in psychology are required to take Psy 101 and Psy 215 and an additional twelve credits in advanced psychology courses.

Recommended Course Sequence for a Major in Psychology

First Semester		Second Semester	
Psy 101 General Psychology*	3	Major Elective	3
Eng 101 Composition I	3	Eng 102 Composition II	3
Core Requirements	9	Core Requirements	9
CST 101 Core Studies I	1	PE 100 Activity	0
PE 100 Activity	0		
	16		15

Third Semester		Fourth Semester	
Major Elective	3	Major Elective	3
or Psy 215 Research and Design*		or Psy 215 Research and Design*	
Core Requirements	12	Core Requirements	9
		Free Elective	3
	15		15

Fifth Semester		Sixth Semester	
Psy 211 Experimental Psychology I †	3	Psy 212 Experimental Psychology II †	3
Major Elective	3	Major Elective	3
or Psy 215 Research and Design*		or Psy 215 Research and Design*	
Free Electives	9	Free Electives	9
	15		15

Seventh Semester		Eighth Semester	
Psy 395 Independent Research †	3	Psy 396 Independent Research †	3
Cooperative Education †	6	Free Electives	13
Free Electives	6		
	15		16

*Required
†Recommended

PSY 101. GENERAL PSYCHOLOGY **Three credits each**

An introduction to the field of psychology with emphasis on objective and systematic methods of inquiry. Extensive treatment of major psychological topics such as sensation, perception, learning, motivation, intelligence, and personality development. Frustration, conflict, and mental health also receive attention.

PSY 201. ADVANCED GENERAL PSYCHOLOGY **Three credits**

A more detailed study of topics treated only superficially in the introductory course. There will be emphasis on contemporary readings.

Prerequisite: Psy 101.

PSY 203. CONTEMPORARY PSYCHOLOGICAL THEORIES **Three credits**
An examination of current theories in psychology, with emphasis upon the major systematic and "miniature" learning theories.
Prerequisite: Psy 101.

PSY 206. HISTORY OF PSYCHOLOGY **Three credits**
A study of the philosophic and scientific roots of contemporary psychology, with emphasis on the applicability of past questions and knowledge to current psychological thought.
Prerequisite: Psy 101.

PSY 211-212. EXPERIMENTAL PSYCHOLOGY **Three credits each**
A lecture and laboratory course designed to familiarize the student with the methods and the results of modern psychological research. The course includes a study of several of the famous experiments in the field of psychology. Also included is practice with the older as well as the more recent methods of experimental research. Lecture and laboratory. Fee: $35 each semester.
Prerequisite: Psy 215.

PSY 213. PHYSIOLOGICAL PSYCHOLOGY **Four credits**
A study of the physiological mechanisms mediating behavior. Emphasis on the structure and function of the nervous system and the neurophysiological bases of sensory processes, emotion, abnormal behavior, sleep, learning and memory. Laboratory experience includes brain dissection, small animal experimentation, and demonstrations of neurosurgical technique. Fee: $15.
Prerequisites: Psy 101; junior or senior standing.

PSY 214. SENSORY AND PERCEPTUAL PROCESSES **Three credits**
Principles and phenomena of human sensory and perceptual processes are studied within the visual, auditory, olfactory, gustatory, proprioceptive and cutaneous systems. Students are familiarized with techniques used in the investigation of sensory and perceptual phenomena.
Prerequisite: Psy 101.

PSY 215. RESEARCH DESIGN AND ANALYSIS **Three credits**
An introduction to the use of scientific methods as a means of studying behavior. This course is required of all majors.

PSY 221. DEVELOPMENTAL PSYCHOLOGY **Three credits**
The course provides a general view of human growth and development from conception through infancy, childhood, and adolescence. It focuses on innate characteristics and the manner in which they are modified by the environment during the developmental process. Psychosocial development as well as physical, language, and intellectual development are considered.
Prerequisite: Psy 101.

PSY 232. HUMAN BEHAVIOR **Three credits**
Human adjustment and maladjustment to life situations with emphasis on motivation, emotional control, personality formation, and the treatment of the lesser personality disorders.
Prerequisite: Psy 101.

PSY 242. PSYCHOLOGICAL TESTS **Three credits**
A survey of the functions measured by psychological tests with emphasis on intelligence and personality. A variety of the group and individual tests which measure these functions are studied. This course is a prerequisite for Psy 245.
Prerequisite: Psy 101.

PSY 243. INDUSTRIAL PSYCHOLOGY **Three credits**
A survey of the applied areas of personnel, organizational, human factors, and consumer psychology.
Prerequisite: Psy 101.

PSY 245. CLINICAL PSYCHOLOGY **Three credits**
A survey of the clinical method in psychology with consideration of diagnostic and treatment techniques and the role of the professional psychologist in various settings.
Prerequisites: Psy 242 and Psy 331.

PSY 255. INTRODUCTION TO SOCIAL PSYCHOLOGY **Three credits**
A general survey of the field of social psychology. Social factors in human nature; psychology of individual differences; social interaction; collective behavior, psychology of personality; social pathology.
Prerequisites: Soc 101 or Ant 101 or Psy 101, or approval of instructor.

PSY 311. COMPARATIVE PSYCHOLOGY **Three credits**
A survey of underlying genetic and biological mechanisms influencing human and non-human behavior. Emphasis is on the role of evolution and natural selection in the development of behavioral adaptations, and to behavioral comparisons among species. Topics include the fields of ethology, sociobiology, and behavioral genetics.
Prerequisite: Psy 101.

PSY 325. THE EXCEPTIONAL INDIVIDUAL **Three credits**
A study of the psychological, physical, and social problems and needs of exceptional individuals. Major emphasis is placed on the diagnosis, psychological assessment, and clinical observation of three types of exceptionality: the mentally defective, gifted, and sensory-motor impaired.
Prerequisites: Psy 101 and Psy 221.

PSY 331. ABNORMAL PSYCHOLOGY **Three credits**
A general survey of the principle forms of mental abnormalities, with emphasis on causes, symptoms, course, and treatment.
Prerequisite: Psy 232.

PSY 395-396. INDEPENDENT RESEARCH **One to three credits**
Independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.
Prerequisite: Approval of department chairperson is required.

PSY 397. SEMINAR **(Maximum of three credits per student) One to three credits**
Presentations and discussions of selected topics.
Prerequisite: Approval of department chairperson is required.

PSY 399. COOPERATIVE EDUCATION **Three or six credits**
Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)
Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

PSY 198/298/398. TOPICS IN PSYCHOLOGY **Variable credit**
A study in topics of special interest not extensively treated in regularly offered courses.

THEATER ARTS

Associate Professor Campbell, Chairperson; Professors Emeritus Groh, Holm; Associate Professor O'Neill, Director of Theater; Adjunct Faculty Phair, Cardoni, Turcan, Chapline.

Total minimum number of credits required for a major in Theater Arts leading to the B.A. degree — 121.
Total minimum number of credits required for a minor — 18.

The goal of the Theater Arts program at Wilkes University is to develop the skills, crafts, and imagination of its students within the liberal arts context. The program is a strong pre-professional curriculum requiring 48 credit hours in the major distributed in the areas of dramatic literature, theater history, play analysis, acting, directing, scenic design, lighting and production. This broad preparation at the undergraduate level develops a foundation for any theater specialization and the best theater artists — be they actors, directors, designers, or playwrights — almost always have this kind of educational background.

Students having an interest in music and dance may elect courses in either area, or both, thereby further enhancing their preparation for professional work.

The Theater Arts program is housed in the Dorothy Dickson Darte Center for the Performing Arts, a fully equipped, professional facility, unsurpassed in its ability to provide for the needs of a major program in theater.

Recommended Course Sequence for a Major in Theater Arts

First Semester		Second Semester	
Eng 101 Composition I	3	Eng 102 Composition II	3
THE 143 Production	3	COM 101 Public Speaking	3
THE 241 Acting I or Core Requirement	3	THE 142 Speech for the Stage	3
Core Requirements	6	Core Requirements	6
CST 101 Core Studies I	1	THE 141 Theater Laboratory	1
PE 100 Activity	0	PE 100 Activity	0
	16		16

Third Semester		Fourth Semester	
THE 240 Play Structure and Criticism	3	THE 344 Scene Design I	3
THE 241 Acting I or Core Requirement	3	THE 242 Acting II or Theater Elective	3
THE 342 Lighting for the Stage	3	Eng 152 World Literature II	3
Eng 151 World Literature I	3	Core Requirements	6
Core Requirement	3	THE 141 Theater Laboratory	1
THE 141 Theater Laboratory	1		
	16		16

Fifth Semester		Sixth Semester	
THE 340 Theater History I	3	THE 341 Theater History II	3
THE 345 Directing I	3	THE 345 Directing II or Theater Elective	3
Dramatic Literature Requirement	3	Core Requirements	9
Core Requirements	6	THE 141 Theater Laboratory	1
THE 141 Theater Laboratory	1		
	16		16

Seventh Semester		Eighth Semester	
THE 397 Senior Seminar	3	THE 348 Workshop or Theater Elective	3
Dramatic Literature Requirement	3	Free Electives	9
Core Requirement	3		12
Free Elective	3		
THE 141 Theater Laboratory	1		
	13		

Minor in Theater Arts

Required Course:

THE 143 Theatrical Production

Electives:

Five of the following:
THE 142 Speech for the Stage
THE 240 Fundamentals of Play Structure and Criticism
THE 241 Acting I
THE 242 Acting II
THE 340 Theater History I
THE 341 Theater History II
THE 342 Lighting for the Stage
THE 344 Scene Design
THE 345 Directing I
THE 346 Directing II

THE 140. APPROACH TO THEATER **Three credits**
Attention will be directed to the importance of the dramatic imagination in reading and viewing plays, with the objective of developing a critical appreciation of the theater. Lecture, discussion, demonstration, films, college theater performances. (Formerly Th. Arts 101)

THE 141. THEATER LABORATORY **One credit**
A study, through the application of various techniques of different facets of theater such as auditioning, costuming, fencing, make-up, masks, mime, scene study, soliloquy, stage combat, textual analysis, and voice. Guest lecturers, master classes, workshops. Required of all Theater Arts majors every semester. May be repeated for a total of six hours.

THE 142. SPEECH FOR THE STAGE **Three credits**
Instruction and exercises in vocal development for the stage, including diction, delivery, and interpretation. Laboratory sessions. (Formerly Th. Arts 131)

THE 143. THEATER TECHNOLOGY **Three credits**
An exploration of the many physical facets of theatrical production by introducing the student to the process of translating the concept of a design into physical actuality and of adapting a production to the requirements of a stage. Class and workshop. (Formerly Th. Arts 141)

THE 144. DEPARTMENT PRACTICUM IN THEATER PRODUCTION **One to two credits**

The Department Practicum in theater production may be taken for one to two credits per semester with the total not to exceed six. Students may earn credit for major roles and positions of major responsibility in the above cocurricular activities. Credit for participation in these activities is optional, and voluntary participation (without credit) is also encouraged. The department, through the advisor or instructor of the activity, has the authority to approve or reject any contract for credit under this designation. Approval of credit must be by advisor and Department Chairperson.

THE 240. FUNDAMENTALS OF PLAY STRUCTURE AND CRITICISM **Three credits**

A study of critical techniques in interpreting plays and the application of such techniques to evaluating plays for stage presentation. (Formerly Th. Arts 201)

Prerequisite: Eng 102.

THE 241. ACTING I **Three credits**

Basic acting techniques. Creating a variety of characters for the stage through the use of vocal interpretation, physical movement, improvisation, and theater games. (Formerly Th. Arts 211)

THE 242. ACTING II **Three credits**

An introduction to the major theories, aims, and styles of acting through performing various roles and monologues in selected dramatic scenes. (Formerly Th. Arts 212)

Prerequisite: THE 241.

THE 340. THEATER HISTORY I **Three credits**

A survey of the historical development and background of theatrical art from ancient times through the seventeenth century. (Formerly Th. Arts 331)

THE 341. THEATER HISTORY II **Three credits**

A survey of the historical development and background of theatrical art from the eighteenth century to the present. (Formerly Th. Arts 332)

Prerequisite: THE 340.

THE 342. LIGHTING FOR THE STAGE **Three credits**

Principles of lighting and the use of these principles in either simple or sophisticated lighting systems. Students will work with instruments and equipment of the lighting technician. Class and workshop. (Formerly Th. Arts 343)

Prerequisite: THE 141.

THE 344. SCENE DESIGN **Three credits**

The nature and function of scenic art with emphasis on contemporary theories and techniques. (Formerly Th. Arts 344)

Prerequisite: THE 141.

THE 345. DIRECTING I **Three credits**

An introduction to the principles of directing including play selection, composition, casting, blocking, and rehearsing. Class and workshop. (Formerly Th. Arts 351)

Prerequisite: THE 141 or departmental permission.

THE 346. DIRECTING II **Three credits**

A study of special problems in directing. Students will prepare a prompt book, critique productions, and direct a one-act play. (Formerly Th. Arts 352)

Prerequisite: THE 345.

THE 347. CHILDREN'S THEATER **One to three credits**

Methods of interpreting and performing plays for young audiences. Class projects will evolve into theatrical performances for children.

Prerequisites: THE 143 and 241, or permission of the department.

THE 348. THEATER WORKSHOP **Three credits**

An opportunity to prepare the full production of a short play for an audience. Working closely with members of the faculty, the student will cast and direct the play and supervise the lighting, design, and construction for the production. Required for certification in education. (Formerly Th. Arts 380)

Prerequisite: Permission of the department.

THE 395-396. INDEPENDENT RESEARCH **One to three credits**

Independent study and research for advanced students in theater under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.

THE 397. SENIOR SEMINAR/THEATER **Three credits**

Discussion, research, and exploration of a selected topic in conjunction with a departmental theater production. Presentations and a research project. Required of all Theater concentrators. (Formerly Th. Arts 397)

THE 198/298/398. TOPICS **One to three credits**

A study of topics of special interest not extensively treated in regularly offered courses.

THE 399. COOPERATIVE EDUCATION **Three or six credits**

Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)

Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.



WOMEN'S STUDIES

Women's Studies Coordinating Committee: Professors Elmes-Crahall, Garr, P. Heaman, Kaminski, Taylor.

Total minimum number of credits required for a minor — 18.

Women's Studies is an interdisciplinary program in which students may earn a minor by taking Women's Studies 101 and fifteen additional credit hours in a variety of designated courses offered by various departments and approved by the Women's Studies Coordinating Committee. Courses that may count toward the minor are typically offered in the Departments of Business Administration and Economics, Communications, English, History, Foreign Languages, Nursing, Political Science, and Sociology, among others. As part of the requirement for the minor, students take a seminar or independent study* in which they undertake an extensive research paper or project and present the results in a colloquium of students and faculty participating in the Women's Studies Program.

The minor is designed to add a professionally and personally valuable concentration for students majoring in such areas as business, sociology, English, communications, and nursing, as well as to students in pre-medical and pre-law courses of study.

Students who intend to declare a minor in Women's Studies should take WS 101 before taking more than two other courses offered in the minor.

Students who select the minor should apply to a member of the Women's Studies Coordinating Committee for an advisor who will aid them in the selection of courses.

Course offerings that will be eligible for the Women's Studies minor during the 1990-1991 academic year include, in addition to WS 101:

Soc 200	The Family (F 1990)
Soc 398-I	Human Sexuality (F 1990)
Soc 398-II	Human Sexuality (S 1991)
Com 398	Intercultural Communications (F 1990)
PS 398	Studies in Peace and War (F 1990)
Phl 398	Women and Moral Theory (S 1991)
Ec 398/BA 398	Topics: Women in the Economy
BA 398	Women in the Economy (S 1991)
Hst 398	Women in the Industrial Era: 1750 to the Present (S 1991)

Other courses may be added to this list and publicized by the Coordinating Committee during the current academic year.

*395, 396, or 397 course in their major.

WS 101. INTRODUCTION TO WOMEN'S STUDIES **Three credits**

Introduction to Women's Studies is a lecture/discussion course. It introduces students to the theoretical assumptions and historical development of feminist thought. It examines a variety of contemporary issues related to race, gender, class, culture, sexuality, the family, reproduction, language and discourse in the light of these theoretical assumptions. Designated writing intensive.

Offered every fall semester.

The School of Science and Engineering

Umid R. Nejib, Ph.D.
Dean of the School

The School of Science and Engineering includes seven departments. A wide variety of innovative programs and degrees are offered, based on the philosophy of immersing the student in a coherent educational environment designed to nurture scientific curiosity, professional growth and self-confidence, as well as a mature understanding of the humanistic considerations essential to meaningful scientific and technical progress. This environment, which is predicated on the notion that the relationship between the faculty member and the student is like that of the craftsman and the apprentice, is intended to enhance the ability of the student to integrate knowledge, recognize its universality, use it effectively in solving problems, and relate it responsibly to actual professional and community issues. This combined effort provides the student with the scientific knowledge and analytical skills necessary for ready entry into industry, health-science professions, graduate study, or research.

The various programs complement each other and permit significant interaction among students and faculty, as well as among colleagues, and are so structured as to provide the student with strong investigative, experimental, and computer experiences through careful curricular design and the use of advanced equipment and techniques. The diverse scientific and technological needs of government, industry, and the community are served through the School's strong and current curricula in the sciences and engineering, the availability of an extensive pool of scientific and technical expertise, and the existence of specialized research Centers and the Technology Transfer Program. Funding of joint university and industry projects has underscored the School's high level of scientific and technological expertise, and has included relationships with not only local firms but with world leaders in industry. This activity adds an important dimension to the learning experience of the undergraduate student and enhances their preparation as the scientists and engineers of the future.

The School has entered into transfer articulation agreements with two-year colleges as well as four-year colleges and universities; most of the programs offered by the School are available to part-time and evening students.

The School of Science and Engineering includes the following departments:

Aerospace Studies
Biology
Chemistry
Earth and Environmental Sciences
Engineering
Mathematics & Computer Science
Physics

AEROSPACE STUDIES (Air Force ROTC)

Lieutenant Colonel Matson, Professor, Chairperson; Assistant Professors Major Newton, Captain King, Captain Mathias.

The Air Force ROTC program at Wilkes University allows students to earn commissions as Air Force officers while they obtain a college degree. Students may choose to enroll in either the four-year or two-year program or any variation thereof. A four-year cadet enrolls in the General Military Course (GMC) during the first two years of school and the Professional Officer Course (POC) during the last two years. The GMC is open to all incoming freshmen; sophomores who can program all four GMC courses in their sophomore year (the dual-enrollee program); or those who have four years of college remaining. GMC STUDENTS INCUR NO MILITARY OBLIGATION UNLESS THEY RECEIVE AN AFROTC SCHOLARSHIP. The POC is available to students with at least two academic years remaining at either the undergraduate or graduate level or a combination of the two. Students interested in the POC program must apply for entry EARLY IN THEIR SOPHOMORE YEAR. To enter the POC, students must pass a physical, an officer qualification test, and have an acceptable academic rating. Four-year cadets must complete a four-week field training program; two-year applicants must complete a six-week field training program during the summer before POC entry. Four semester hours of credit may be earned in the GMC and twelve semester hours in the POC. There is also a one-semester-hour course for pilot and navigator candidates. POC cadets earn a $100-per-month, tax-free subsistence allowance during the academic year and incur a military obligation. STUDENTS MAY ALSO COMPETE FOR FULL-TUITION AFROTC SCHOLARSHIPS. WILKES UNIVERSITY OFFERS FREE ROOM AND BOARD TO ALL FOUR-YEAR AFROTC SCHOLARSHIP WINNERS, AS WELL AS TO STUDENTS FROM OTHER COLLEGES WHO WIN AFROTC SCHOLARSHIPS AND WHO CHOOSE TO TRANSFER TO WILKES. Students who complete the POC and graduate are commissioned as Second Lieutenants in the USAF Reserve. They serve on active duty in a specialty they have chosen, consistent with Air Force needs. Qualified students can compete for jobs as pilots, navigators, nurses, engineers, missile officers, and in many other fields. Regardless of your degree area, the Air Force can find a place for you. For more information on the Air Force ROTC program at Wilkes, call, toll-free, 1-800-572-4444, ext. 4860 (in state) or 1-800-537-4444, ext. 4860 in adjacent states.

Supplemental Requirements

To enhance the career utility and officer performance of students commissioned through AFROTC, all POC cadets and GMC scholarship cadets must successfully complete the following supplemental courses in addition to all Aerospace Studies courses:

All scholarship cadets must take two semesters of a foreign language or have two years of a foreign language in high school.

GMC scholarship cadets must successfully complete a course in English composition prior to POC entry. They are also encouraged to take a course in speech. Nonscholarship GMC cadets are not required to take the supplemental courses; however, these courses may enhance their chances for POC selection.

POC cadets must successfully complete a course in mathematical reasoning prior to commissioning.

Uniforms

Uniforms, equipment, and textbooks for AFROTC are supplied by Wilkes University and the U.S. Air Force. All new GMC cadets are required to pay an initial deposit of $50.00. All new POC cadets are required to pay an initial deposit of $130.00. Of the initial deposit, $15.00 will be kept to pay for new shoes and socks, which are nonreturnable and considered purchased. If other uniform items are returned in an unsatisfactory condition, part of the deposit will be used to pay for the unsatisfactory items. If the cadet returns the items in a satisfactory condition, the remaining deposit money will be returned.

Light Aircraft Training for ROTC (LATR)
(mandatory for pilot candidates)

The LATR is designed primarily for cadets in the POC who intend to enter Air Force pilot training upon graduation and who do not possess an FAA pilot rating of Private Pilot or higher. It identifies applicants who possess the qualifications necessary to fly high-performance aircraft. The program consists of a ground phase given by officers of the detachment and a flying phase with dual and solo flight instruction conducted near San Antonio, Texas, or at Embry-Riddle Aeronautical University, Daytona Beach, FL. The LATR is normally conducted during the summer between the junior and senior years. Pilot candidates must attend LATR prior to receiving their commissions.

Advanced Training Program (optional)

This program allows POC members to visit a USAF base for three weeks and work with an active duty officer in the student's chosen career area during the summer between the junior and senior years. Transportation from the legal residence of the cadet to the advanced training base and return, food, lodging, and medical and dental care are provided by the Air Force in addition to a weekly salary.

Leadership Laboratory (mandatory)

AFROTC cadets must participate in Leadership Laboratory one hour a week during each semester. This program involves a progression of experience designed to develop each student's leadership potential in a supervised training laboratory. Areas examined are Air Force customs and courtesies, drill and ceremonies, career opportunities, and the life and work of an Air Force junior officer.

Field Training (mandatory)

Candidates for enrollment in the POC will attend AFROTC field training during one summer. The training, conducted at selected Air Force bases, gives students an opportunity to observe Air Force units and people at work and at home; participate in marksmanship, survival, athletics, and leadership training activities; take aircraft orientation flights; and work with contemporaries from other colleges and universities. Transportation from the legal residence of the cadet to the field training base and return, food, lodging, and medical and dental care are provided by the Air Force. The cadet receives approximately $400 for the four-week field training program or $600 for the six-week field training program.

Recommended Course Sequence Leading to a Commission in the United States Air Force

General Military Course (GMC) — Consists of four one-credit courses which are introductory in nature and open to freshmen or sophomores. Nonscholarship students incur no military obligation by enrolling in these courses.

First Semester		Second Semester	
AS 101 U.S. Military Forces in the Contemporary World I	1	AS 102 U.S. Military Forces in the Contemporary World II	1
AS 000 Leadership Laboratory	0	AS 000 Leadership Laboratory	0
	1		1
Third Semester		**Fourth Semester**	
AS 201 The Development of Air Power I	1	AS 202 The Development of Air Power II	1
AS 000 Leadership Laboratory	0	AS 000 Leadership Laboratory	0
	1		1

AS 000 Leadership Laboratory is mandatory for all cadets who enroll in Air Force ROTC. Lab meets every week for one hour, usually at the Marts Center.

Variations in the above schedule are possible. Sophomores with no AFROTC experience can enroll in both the one-credit freshman and sophomore classes (the dual-enrollee program). Students with **no** GMC experience may still apply for POC entry, but they must apply as soon as possible in the sophomore year. For further information, call (717) 829-0194 or 1-800-572-4444, ext. 4860, within state or 1-800-537-4444, ext. 4860, from adjacent states.

Summer Field Training (Four Weeks)

Professional Officer Course (POC) — Consists of four three-credit courses open to students who have at least two full-time years of college remaining. Students enrolled in the POC receive $100 per month and are under military obligation.

Fifth Semester		Sixth Semester	
AS 301 Concepts of Management	3	AS 302 Concepts of Leadership	3
AS 000 Leadership Laboratory	0	AS 000 Leadership Laboratory	0
	3		3
Seventh Semester		**Eighth Semester**	
AS 311 National Security Forces in American Society I	3	AS 312 National Security Forces in American Society II	3
AS 000 Leadership Laboratory	0	AS 000 Leadership Laboratory	0
	3		3

AS 000 Leadership Laboratory is mandatory for all cadets who enroll in Air Force ROTC. Lab meets every week for one hour, usually at the Marts Center.

Variations in the above schedule are possible. Sophomores with no AFROTC experience can enroll in both the one-credit freshman and sophomore classes (the dual-enrollee program). Students with **no** GMC experience may still apply for POC entry, but they must apply as soon as possible in the sophomore year. For further information, call (717) 829-0194 or 1-800-572-4444, ext. 4860, within state or 1-800-537-4444, ext. 4860, from adjacent states.

General Military Courses

The General Military Courses (GMC) constitute a two-year program for freshmen and sophomores and are designed to provide a general knowledge of the role, organization, missions, and historical development of U.S. air power. Students enrolled in the GMC who are not on Air Force scholarships incur no military obligations. **Note: AS 101-102-201-202 may be substituted for PE 100 series.**

AS 000. LEADERSHIP LABORATORY — **No credit**

Involves a progression of experience designed to develop each student's leadership potential in a supervised training laboratory. Examines Air Force customs and courtesies, drill and ceremonies, career opportunities, life and work of an Air Force junior officer. There are two sections offered. One section meets every Thursday for one hour. **All AFROTC students must elect this section.** A second section is for students who are dual-enrolled in the GMC (concurrently enrolled in an AS 100 and an AS 200 course). This second section meets on Wednesday afternoons. All dual-enrolled students must elect both sections.

AS 101. U.S. MILITARY FORCES IN THE CONTEMPORARY WORLD I — **Fall — One credit**

Background, missions, and functions of U.S. military forces, with emphasis on U.S. Air Force organization, doctrine, and strategic forces. Development of individual communication skills.

AS 102. U.S. MILITARY FORCES IN THE CONTEMPORARY WORLD II — **Spring — One credit**

U.S. general purpose military forces; insurgency and counter-insurgency; aerospace support forces and organizations. Development of individual communication skills.

AS 201. THE DEVELOPMENT OF AIR POWER I **Fall — One credit**
Air power development in historical perspective through the end of World War II; evolution of missions, concepts, doctrine, and employment, with emphasis on changes in conflict and factors which have prompted technological developments. Development of individual communication skills.

AS 202. THE DEVELOPMENT OF AIR POWER II **Spring — One credit**
Air power development from the end of World War II to the present; changing missions and employment of air power in support of national objectives. Development of individual communication skills.

Prerequisite: AS 201 or permission of instructor.

AS 251. FLIGHT PROGRAM GROUND TRAINING **Spring — One credit**
Prepares AFROTC cadets and others for FAA private pilot examination through study of general regulations, air traffic rules, accident reporting, air navigation, weather, safety, principles of flight, basic operations, flight computer. Limited spaces beyond AFROTC requirements are available to Wilkes juniors or seniors. Two hours of class/laboratory per week.

Professional Officer Courses

The Professional Officer Courses (POC) constitute a four-semester program, normally taken during the junior and senior years, leading to commissioning as an Air Force officer. The POC concentrates on concepts and practices of management, concepts and practices of leadership, national defense policy, and communicative skills.

AS 301. CONCEPTS OF MANAGEMENT **Fall — Three credits**
General theory and practice of management with special reference to the Air Force. Covers evolution of management thought including classical, behavioral, and management science schools; study of information systems; quantitative approach to decision-making; policy formulation, principles and practices in planning, organizing, staffing, actuating, directing, and controlling business and Air Force activities; resource control techniques; social and ethical issues within the management process; development of communicative skills.

Prerequisite: POC membership. **Note: AFROTC cadets may substitute AS 301 for BA 251.**

AS 302. CONCEPTS OF LEADERSHIP **Spring — Three credits**
Air Force leadership at the junior officer level, including its theoretical, professional, and legal aspects; practical experience in influencing people, individually and in groups, to accomplish organizational missions effectively; development of communicative skills.

Prerequisite: AS 301 or permission of instructor.

AS 311. NATIONAL SECURITY FORCES IN AMERICAN SOCIETY I **Fall — Three credits**
The role and functions of the professional military officer in a democratic society and civil-military interaction; basic framework of defense policy and formulation of defense strategy; the impact of East Asia, Latin America, Africa, the Middle East, and the Soviet Union on U.S. national security policy. Development of individual communication skills.

Prerequisite: POC membership or permission of instructor. **Note: AFROTC cadets may substitute AS 311 for PS 398 with History and Political Science Department approval.**

AS 312. NATIONAL SECURITY FORCES IN AMERICAN SOCIETY II **Spring — Three credits**
The problems of developing defense strategy in a rapidly changing technological environment; effective deterrent posture and management of conflict; dynamics and agencies of defense policy making, analyzed through case studies.

Prerequisite: AS 311 or permission of instructor.

BIOCHEMISTRY

Professor Swain, Chairperson; Professor Emeritus Bohning; Professors Faut, Rozelle, Salley, Stine; Assistant Professor Wignot; Laboratory Manager Bianco; Adjunct Professor Gregorek.

Total minimum number of credits required for a major in Biochemistry leading to the B.S. degree — 136.
Total minimum number of credits required for a major in Biochemistry leading to the B.A. degree — 137.

The Biochemistry curriculum is designed to provide comprehensive background education and training for those students interested in this specialty area. The B.S. degree curriculum was developed for those students who wish to prepare for Biochemistry as a professional option. Holders of the degree can seek employment directly in the field or they can pursue advanced degrees in graduate school. Positions are available in a number of biological and chemical companies, government laboratories, and college and university laboratories.

The B.A. degree was developed for those students who are interested in Biochemistry as a means of preparation for entrance into health science professional schools. Examples of such schools are allopathic, osteopathic, and podiatric medicine, dental medicine, pharmacy, optometry, etc. A specific feature of the B.A. degree program is that students may pursue the first three years of the biochemistry degree curriculum in the three year option under the Philadelphia College of Osteopathic Medicine — Wilkes University combined seven year medical and baccalaureate degree program.

Recommended Course Sequence for a Bachelor of Arts Degree and Bachelor of Science Degree in Biochemistry

First Semester	B.A.	B.S.
Chm 115 Elements and Compounds	4	4
Bio 121 Principles of Modern Biology I	4	4
Mth 111 Calculus I	4	4
Eng 101 Composition I	3	3
CST 101 Core Studies I	1	1
PE 100 Activity	0	0
	16	16

Second Semester	B.A.	B.S.
Chm 116 The Chemical Reaction	4	4
Bio 122 Principles of Modern Biology II	4	4
Mth 112 Calculus II	4	4
Eng 102 Composition II	3	3
CS Elective	3	3
PE 100 Activity	0	0
	18	18

Third Semester

	B.A.	B.S.
Chm 231 Organic Chemistry I	4	4
Phy 201 General Physics	4	4
Chm 223 Systematic Inorganic Chemistry	3	3
Mth 211 Intro. Linear Algebra and Differential Equations	4	4
Core Requirement	3	—
	18	15

Fourth Semester

	B.A.	B.S.
Chm 232 Organic Chemistry II	4	4
Phy 202 General Physics II	4	4
Chm 278 The History and Literature of Chemistry	2	2
Core Requirements	6	3
Mth 212 Multivariable Calculus	—	4
	16	17

Fifth Semester

	B.A.	B.S.
Chm 363 Biochemistry I	4	4
Chm 251 Physical Chemistry I	4	4
Chm 241 Quantitative Inorganic Analysis	4	4
Bio 221 Cellular and Molecular Biology	4	4
	16	16

Sixth Semester

	B.A.	B.S.
Chm 362 Biochemistry II	3	3
Chm 252 Physical Chemistry II	4	4
Chm 272 Chemical Structure Determination	—	3
Core Requirements	6	4
Bio 303 Bacteriology	4	4
	17	18

Seventh Semester

	B.A.	B.S.
Bio/Chm 397 Seminar	0	0
Bio 308 Genetics	4	4
Chm 391 Senior Research	1	1
Core Requirements	9	9
Electives	4	—
Chm 323 Advanced Inorganic Chemistry	—	4
	18	18

Eighth Semester

	B.A.	B.S.
Bio/Chm 397 Seminar	1	1
Bio 341 Immunology and Immunochemistry	4	4
Chm 392 Senior Research	2	2
Core Requirements	3	11
Electives	8	–
	18	18

Special Requirements

Chemistry 391-392 are laboratory research courses. A student may obtain permission of the department to carry out a Senior Project which is not laboratory research. This permission would be granted only in exceptional cases. Students who are seeking teaching certification are required to take only Chm 391 (1 credit) but must complete a written report and give a Department Seminar on their work.

All Chemistry majors must complete three credit-hours of Computer Science courses.

The Chemistry Department strongly recommends that students elect a foreign language to satisfy one of the core humanities requirements. The language of choice should be German, Russian, or French in that priority.

The Chemistry Department strongly recommends that students elect COM 101, Public Speaking.

All upper division Chemistry majors are expected to attend Seminar. Seniors must take Chm 397 and participate in the Seminar program.

BIOLOGY

Professor Turoczi, Chairperson; Professors Emeriti Ogren, Reif; Associate Professors Hayes, Klemow; Assistant Professors Long, Pidcock, Steele; Adjunct Faculty Zehner; Laboratory Preparations Specialist, Steuben.

Total minimum number of credits required for a major in Biology leading to the B.A. degree — 124.

Total minimum number of credits required for a major in Biology leading to the B.S. degree — 124.

Total minimum number of credits required for a minor — 22.

The biology program is a general program covering basic areas of biology. Specific pre-professional training is minimized in favor of the broadest possible background in the liberal arts as well as the biological sciences.

The B.A. curriculum offers flexibility so that those students in secondary education who are preparing to teach can include the professional semester of student-teaching either in the seventh or eighth semester. In addition, this program provides the opportunity for students to double major and jointly satisfy the requirements of both the Department of Biology as well as those of the other department involved.

The B.S. curriculum meets all of the liberal arts requirements for the Bachelor of Arts degree. In addition, it provides a greater concentration of advanced biology courses. This program is recommended for those students planning to enter industry, professional schools, or continue with graduate study in biology.

In order to emphasize the broadening aspects of biological knowledge, the department has established categories of specific biological fields from which the student must achieve reasonable diversity in the selection of upper-level courses. The four categories are (1) botanical biology, (2) organismic biology, (3) populational biology, and (4) molecular/cellular biology. The B.A. major is required to take one 300-level course from each of the above named four categories; the B.S. major must take one 300-level course from each of the four categories and additionally select any two courses from those same categories.

Courses within the four categories are constituted as follows:

(1) Botanical — Bio 319, 320, 385
(2) Organismic — Bio 303, 304, 305, 310, 313, 318
(3) Populational — Bio 308, 309, 317, 340, 394
(4) Molecular/Cellular — Bio 312, 315, 321, 322, 323, 341

Students in majors other than Biology may wish to elect a minor in Biology. The minor in Biology shall consist of 22 credits. Required courses are Bio 121-122, 221-222 plus two 300-level, three-credit biology electives. These upper-level electives (exclusive of Independent Research, Bio 395-396) will be selected after consultation with the department chairperson.

Honors Program in Biology

Honor students in Biology will be recognized upon completion of the following requirements: achieving a graduating grade point average of 3.25 or better, receiving grades of 3.00 or better in all biology courses, pursuing independent research in biology and presenting results either at a national or regional scientific conference or through publication of a research paper. The distinction "Honors in Biology" will be recorded on the student's transcript upon graduation.

Recommended Course Sequences for a Major in Biology

First Semester

	B.A.	B.S.
Bio 121 Principles of Modern Biology I	4	4
Chm 115 Elements & Compounds	4	4
Eng 101 Composition I	3	3
Mth 105 Calculus for Life, Managerial, and Social Sciences I or Mth 111 Calculus I	4	4
CST 101 Core Studies I	1	1
	16	16

Second Semester

	B.A.	B.S.
Bio 122 Principles of Modern Biology II	4	4
Chm 116 The Chemical Reaction	4	4
Eng 102 Composition II	3	3
Mth 106 Calculus for Life, Managerial, and Social Sciences II or Mth 112 Calculus II	4	4
	15	15

Third Semester

	B.A.	B.S.
Bio 221 Cellular and Molecular Biology	4	4
Chm 231 Organic Chemistry I	4	4
Core Requirements	6	6
PE 100 Activity	0	0
	14	14

Fourth Semester

	B.A.	B.S.
Bio 222 Comparative Anatomy	4	4
Chm 232 Organic Chemistry II	4	4
Core Requirements	6	6
PE 100 Activity	0	0
	14	14

Fifth Semester

	B.A.	B.S.
Bio 397 Seminar*	1	1
Bio Elective/Research	3	3
Phy 105 Introductory Physics I	4	4
Core Requirements	6	6
Free Elective**	3	—
Mth 150 Elementary Statistics	—	3
	16-17	16-17

Sixth Semester

	B.A.	B.S.
Bio 397 Seminar*	1	1
Bio Elective/Research	3	3
Phy 106 Introductory Physics II	4	4
Core Requirements	6	6
Computer Science Elective	3	3
	16-17	16-17

*Only one semester of Bio 397 is required but it must be taken in either the fifth or sixth semester.
**Any course other than a biology course.

Seventh Semester

	B.A.	B.S.
Bio Elective/Research	3	6
Core Requirements	6	6
Free Electives**	6	3
	15	15

Eighth Semester

	B.A.	B.S.
Bio Elective/Research	3	6
Core Requirement	3	3
Free Electives**	9	6
	15	15

**Any course other than a biology course.

BIO 105. HUMAN BIOLOGY — **Three credits**
This course provides a general study of the anatomy and physiology of the human body as well as the interrelationships between humans and the environment. This course is only open to non-science majors. Lecture, two hours per week; laboratory, two hours per week. Laboratory fee: $35.

BIO 106. CONTEMPORARY ISSUES IN BIOLOGY — **Three credits**
Contemporary Issues in Biology covers selected biological, environmental, and health problems currently faced by mankind, and emphasizes their relevance to basic concepts in modern biology (including such topics as the chemistry of life, the structure and function of cells, genetic code, evolution and natural selection, biological diversity, population biology and ecology). Open only to non-science majors. Lecture, three hours per week.

BIO 107. PLANTS AND HUMAN AFFAIRS — **Three credits**
An examination of plants and their past and present interrelationships with humans. Topics will include: an overview of plant form, function and diversity; ways that plants are used by various societies; detrimental plants; plant propagation; and the importance of plants in the ecosystem. Only open to non-science majors. Two hours of lecture and two hours of laboratory per week. Laboratory fee: $35.

BIO 113. MICROBIOLOGY — **Four credits**
This course presents the basic principles of bacteriology and the relationship of micro-organisms to disease and its prevention, control, and treatment. It considers the effects of microbes within the body and the body's reaction to them. Lecture, three hours a week; laboratory, three hours a week. Laboratory fee: $35.

BIO 115-116. HUMAN ANATOMY AND PHYSIOLOGY — **Four credits each**
This course provides a general study of the human body, its structure and normal function. It provides an appreciation of the complex nature of the human body with relation to the promotion of a healthy organism. Lecture, three hours a week; laboratory, three hours a week. Laboratory fee: $35 each course.

BIO 121. PRINCIPLES OF MODERN BIOLOGY I — **Four credits**
An introduction to concepts of modern biological science for students majoring in biology and other sciences. Course will focus on the structure and function of living matter. A heavy emphasis will also be given to the anatomy and physiology of plants. Three hours of lecture, three hours of laboratory, one hour of discussion per week. Laboratory fee: $35.
Corequisite: Chm 115.

BIO 122. PRINCIPLES OF MODERN BIOLOGY II — **Four credits**
A continuation of Biology 121. Topics include: the structure and function of the vertebrate animal, the causes and nature of biological diversity and concepts of ecology. Three hours of lecture, three hours of laboratory, one hour of discussion per week. Laboratory fee: $35.
Prerequisite: Bio 121.

BIO 221. CELLULAR AND MOLECULAR BIOLOGY **Four credits**

Cell structure in relation to function. Biochemistry and physiology of animal, plant, and bacterial cells and their viruses. The cell in division and development. Three lectures, one discussion, and one three-hour laboratory per week. Laboratory fee: $35.

Prerequisite: Bio 121-122.

BIO 222. COMPARATIVE ANATOMY **Four credits**

This course deals with the evolution and anatomy of the organ systems of vertebrates. Lectures survey the comparative anatomy of the vertebrate classes. Laboratory dissections include the Lamprey, Shark, and Cat in detail. Lecture three hours per week, laboratory three hours per week, discussion one hour per week. Laboratory fee: $35.

Prerequisites: Bio 121-122, 221.

BIO 303. BACTERIOLOGY **Four credits**

Bio 303 is a general introductory course covering the morphology and growth of bacteria, sterilization, and applied uses of bacteria. The laboratory work covers techniques of staining, culturing, and biochemical testing for the identification of bacteria. Lecture, two hours a week; laboratory, three hours a week. Laboratory fee: $35.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.

BIO 304. LIFE OF THE VERTEBRATES **Three credits**

This course presents a view of chordate animals with particular emphasis on the natural history, evolution, and classification of these forms. Lecture, two hours; laboratory, three hours a week. Laboratory fee: $35.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.

BIO 305. INVERTEBRATE BIOLOGY **Four credits**

This course is a study of the major invertebrate phyla with respect to their taxonomy, evolution, morphology, physiology, and ecology. Lecture, two hours a week; laboratory, three hours a week. Laboratory fee: $35.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.

BIO 308. GENETICS **Four credits**

Genetics will present a detailed treatment of genetics beyond the introductory level with particular emphasis on populational and molecular aspects of heredity. Topics will include plant and human genetics. Lecture, two hours; laboratory, three hours a week. Laboratory fee: $35.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.

BIO 309. EVOLUTION **Three credits**

Evolution is the study of living things with time. Theories relating to the origin of life, natural selection, and speciation as processes of organic evolution are emphasized. Lecture, three hours a week. Field trip fee: $15.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.

BIO 310. ANIMAL BEHAVIOR **Four credits**

Animal Behavior is a course emphasizing behavior as the response of an organism to physical and social environmental change, and covering the processes that determine when changes in behavior occur and what form the changes take. Laboratories, using local fauna, demonstrate principles discussed in lecture. Lecture, two hours; laboratory, three hours a week. Laboratory fee: $35.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.

BIO 312. COMPARATIVE PHYSIOLOGY **Four credits**

Comparative Physiology encompasses the study of organ functions and organ system functions in different animal groups. Emphasis will be on the systemic physiology of vertebrate animals. Lecture, two hours; laboratory, three hours a week. Laboratory fee: $35.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.

BIO 313. PARASITOLOGY **Three credits**

Parasitology is the study of organisms that live on or within other organisms and the relationship of these organisms to their hosts. This course deals with the common parasites that infect man and other animals. Lecture, two hours; laboratory, three hours a week. Laboratory fee: $35.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.

BIO 315. MOLECULAR BIOLOGY **Three credits**

Molecular Biology is the study of the energetics, metabolism, and biochemical aspects of living systems. A general biochemical presentation will be provided with reference to proteins, carbohydrates, and lipids with extensive coverage of molecular genetics. Lecture, three hours a week.

Prerequisites: Bio 121-122, 221-222, Chm 231-232, or permission of instructor.

BIO 317. ECOLOGY **Four credits**

Ecology examines contemporary ecological thinking as it pertains to the interrelationships of organisms and their environments. Interactions at the population and community level are emphasized. Lecture, two hours; laboratory, three hours a week. Laboratory fee: $35.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.

BIO 318. DEVELOPMENTAL BIOLOGY **Three credits**

A course dealing with principles of organismic development, gametogenesis, fertilization, cleavage, embryogenesis, differentiation, morphogenesis, regeneration. Laboratory work includes vertebrate embryology, microtechnique, and some experimentation. Lecture, two hours; laboratory, three hours a week. Laboratory fee: $35.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.

BIO 319. PLANT DIVERSITY **Four credits**

A comprehensive survey of bryophytes, vascular plants and plantlike organisms (fungi and algae) emphasizing their structure, reproductive biology, natural history, evolution, and importance to humans. Lecture, two hours per week; laboratory, three hours per week. Laboratory fee: $35.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.

BIO 320. PLANT FORM AND FUNCTION **Four credits**

An introduction to the morphology, anatomy, cytology and physiology of plants, with emphasis on the vascular plants. Structural and functional aspects of plants will be interpreted in relation to each other and within ecological and evolutionary contexts. Lecture, two hours per week; laboratory, three hours per week. Laboratory fee: $35.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.

BIO 321. MAMMALIAN PHYSIOLOGY **Four credits**

This course examines the function of mammalian systems with regard to homeostasis, growth, and reproduction. Emphasis is on human physiology; however, other mammalian systems are discussed to demonstrate physiological adaptability to various environmental situations. Lecture, two hours; laboratory, three hours per week. Laboratory fee: $35.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.

Offered fall semesters.

BIO 322. FUNCTIONAL HISTOLOGY **Four credits**

This course emphasizes the microscopic examination of mammalian tissues from morphological and physiological perspectives. Reference is made to organ embryogenesis to support the understanding of organ form and function. Tissue preparation for histological examination is demonstrated. Lecture, two hours; laboratory, three hours per week. Laboratory fee: $35.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.

Offered spring semesters.

BIO 323. ELECTRON MICROSCOPY FOR LIFE SCIENCES **Three credits**
A comprehensive course in the basic principles and practice of scanning electron microscopy plus introductions to older and newer types of electron microscopy. Lectures and laboratories emphasize scanning electron microscopy techniques for students preparing their own biological specimens and recording their own electron micrographs. Lecture, two hours a week; laboratory, three hours a week. Laboratory fee: $35.

Prerequisites: Bio 121-122, 221-222, or permission of department chairperson.

BIO 340. LIMNOLOGY **Three credits**
A study of the chemical, physical, and biological aspects of freshwater systems. Laboratory investigations will consist of in-depth analyses of local lakes and streams. Lecture, two hours; laboratory, three hours. Laboratory fee: $40.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.

BIO 341. IMMUNOLOGY AND IMMUNOCHEMISTRY **Four credits**
This course is concerned with the biologic mechanisms and chemistry of reactants and mediators associated with natural and acquired states of immunity, tissue and blood serum responses to infection and immunization, and related patho-physiologic alterations of hypersensitivity phenomena in vertebrate animals and man. Two lectures and one three-hour laboratory per week. Laboratory fee: $35.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.

BIO 385. FIELD BOTANY **Three credits**
This is a specialized summertime field course which emphasizes a taxonomic, phylogenetic, and ecological survey of higher plants indigenous to Northeastern Pennsylvania. Due to the extensive field work, enrollment is somewhat more restricted than in other courses; therefore, written permission from the instructor is the prime prerequisite of those upperclassmen wishing to register for the course.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.

BIO 394. BIOLOGICAL FIELD STUDY **One to three credits**
On-site study of biological problems or situations incorporating field documentation and investigation techniques. May be repeated for credit when no duplication of experience results. One hour of lecture per week plus field trip. Fee: variable.

Prerequisites: Bio 121-122, or permission of instructor.

BIO 395-396. INDEPENDENT RESEARCH **One to three credits**
This course involves independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required; it must also be orally presented at an appropriate off-campus science meeting.

Prerequisite: Written approval of department chairman is required. Candidates for Independent Research must have a minimum GPA of 3.00 and be of upper class standing.

BIO 397. SEMINAR **One credit**
Presentations and discussions of selected topics.

Prerequisite: Approval of department chairman is required.

BIO 399. COOPERATIVE EDUCATION **Three or six credits**
Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)

Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

BIO 198/298/398. TOPICS **Variable credit**
A study of topics of special interest not extensively treated in regularly offered courses.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.

CHEMISTRY

Professor Swain, Chairperson; Professor Emeritus Bohning; Professors Faut, Rozelle, Salley, Stine; Assistant Professor Wignot; Laboratory Manager Bianco; Adjunct Professor Gregorek.

Total minimum number of credits required for a major in Chemistry leading to the B.S. degree — 129.
Total minimum number of credits required for a major in Chemistry leading to the B.A. degree — 124.
Total minimum number of credits required for a minor — 22.

The chemistry curriculum is designed to provide a comprehensive background in the fundamentals of the science and to contribute to the general education of the student. Graduates with a B.S. degree may find industrial or government employment or continue advanced studies in a graduate or professional school. The B.A. degree is available for students who need additional flexibility to prepare for a career in secondary education, the health professions (such as medicine, dentistry, or pharmacy), law, business, engineering, computer science, or other related areas. Utilizing existing courses and programs, it is also possible for a student to achieve a B.A. degree with a double major in chemistry and computer science. In all cases students will choose electives for the various career options after consultation with departmental advisors.

A minor in Chemistry consists of the completion of 22 credits in chemistry, including Chm 115 and Chm 116 (or Chm 118). Selection of other courses must be in keeping with the existing prerequisites as specified in this Bulletin.

Wilkes is approved by the American Chemical Society for the professional training of chemists. Students who complete the B.S. program may be certified for membership eligibility in the Society at graduation.

Required courses are indicated in the following suggested curricular outlines which are based on an extensive prerequisite structure. The order of the courses presented in this sequential arrangement is a suggested one. Changes in the order of the courses may be made on an advising basis.

Recommended Course Sequences for a Major in Chemistry

First Semester

	B.A.	B.S.
Chm 115 Elements and Compounds	4	4
Eng 101 Composition I	3	3
Mth 111 Calculus I	4	4
Core Requirement	3	3
CST 101 Core Studies I	1	1
PE 100 Activity	0	0
	15	15

Second Semester

	B.A.	B.S.
Chm 116 The Chemical Reaction	4	4
Eng 102 Composition II	3	3
Mth 112 Calculus II	4	4
CS Elective	3	3
Free Elective	3	3
PE 100 Activity	0	0
	17	17

Third Semester

	B.A.	B.S.
Chm 231 Organic Chemistry I	4	4
Chm 223 Systematic Inorganic Chemistry	3	3
Mth 211 Intro. Linear Algebra and Differential Equations	4	4
Phy 201 General Physics	4	4
	15	15

Fourth Semester

	B.A.	B.S.
Chm 232 Organic Chemistry II	4	4
Chm 278 The History and Literature of Chemistry	2	2
Mth 212 Multivariable Calculus	—	4
Core Requirement	3	–
Phy 202 General Physics II	4	4
	13	14

Fifth Semester

	B.A.	B.S.
Chm 251 Physical Chemistry I	4	4
Chm 241 Quantitative Inorganic Analysis	4	4
Core Requirement	3	3
Free Electives	6	6
	17	17

Sixth Semester

	B.A.	B.S.
Chm 252 Physical Chemistry II	4	4
Chm 272 Chemical Structure Determination	—	3
Core Requirements	9	9
Free Elective	3	–
	16	16

Seventh Semester

	B.A.	B.S.
Chm 323 Advanced Inorganic Chemistry	—	4
Chm 391 Senior Research	1	1
Major Elective	3-4	—
Free Electives	6	6
Core Requirements	6	6
Chm 397 Seminar	0	0
	16-17	17

Eighth Semester

	B.A.	B.S.
Chm 392 Senior Research	2	2
Chm 397 Seminar	1	1
Major Elective	—	3
Free Electives	9	6
Core Requirements	3	6
	15	18

Special Requirements

B.A. degree students must elect a minimum of two 300-level courses, one of which must be in the Chemistry Department.

B.S. degree students must elect a minimum of one 300-level course in addition to required 300-level courses, Chm 323, 391-392, and 397. Cooperative Education may not be counted as an advanced 300-level chemistry elective.

Chemistry 391-392 are laboratory research courses. A student may obtain permission of the department to carry out a Senior Project which is not laboratory research. This permission would be granted only in exceptional cases. Students who are seeking teaching certification are required to take only Chm 391 (1 credit) but must complete a written report and give a Department Seminar on their work.

All Chemistry majors must complete three credit-hours of Computer Science courses.

The Chemistry Department strongly recommends that students elect a foreign language to satisfy one of the core humanities requirements. The language of choice should be German, Russian, or French in that priority.

The Chemistry Department strongly recommends that students elect COM 101, Public Speaking.

All upper division Chemistry and Biochemistry majors are expected to attend Seminar. Seniors must take Chm 397 and participate in the Seminar program.

CHM 99. BASIC MATHEMATICS FOR INTRODUCTORY CHEMISTRY — **No credit**

A remedial course for students desiring an intensive survey of basic mathematical principles used in beginning chemistry courses. Topics include arithmetical operations, exponential notation, dimensional analysis, the writing and solving of equations, graphing, logarithms, and the use of a calculator.

CHM 101-102. CHEMICAL SCIENCE — **Three credits each**

Applications of chemistry in daily life, emphasizing nuclear chemistry, agricultural chemistry, and the chemistry of food and drugs. This course is primarily intended for students who take no other chemistry courses. It does **not** provide prerequisite background for any other chemistry course.

Prerequisite for Chm 102, Chm 101.

CHM 111. INTRODUCTION TO CHEMICAL REACTIONS AND PRINCIPLES — **Four credits**

Three major areas of emphasis will be developed: descriptive inorganic chemistry; acids, bases, and buffers; and radiochemistry. These areas will include gas laws, oxidation-reduction, equilibrium, stoichiometry, the periodic table, and solutions. Not open to chemistry majors. Class, three hours a week; laboratory, three hours a week; problem session, one hour a week. Fee: $35.

CHM 115. ELEMENTS AND COMPOUNDS — **Four credits**

Emphasis is placed on the periodic table and stoichiometry, including chemical properties, physical states, and structure. Class, three hours a week; laboratory, three hours a week; problem session, one hour a week. Fee: $35.

CHM 116. THE CHEMICAL REACTION — **Four credits**

A detailed study of chemical equilibria in aqueous solution. Class, three hours a week; laboratory, three hours a week; problem session, one hour a week. Fee: $35.

Prerequisite: Chm 115.

CHM 118. CHEMISTRY FOR ENGINEERS — **Three credits**

An introduction to chemical equilibria, electrochemistry, thermodynamics, chemical kinetics,

and the chemistry of selected metals and nonmetals. Class, two hours a week; laboratory, three hours a week; problem session, one hour a week. Fee: $35.

Prerequisite: Chm 115, engineering majors only.

CHM 130. ORGANIC AND BIOLOGICAL CHEMISTRY **Four credits**

An introduction to the structure and reactions of carbon compounds as a background for the study of interactions of biologically active compounds such as carbohydrates, proteins, and nucleic acids. Not open to chemistry majors. Lecture, three hours a week; laboratory, three hours a week; problem session, one hour a week. Fee: $35.

Prerequisite: Chm 111 or 115.

CHM 223. SYSTEMATIC INORGANIC CHEMISTRY **Three credits**

A systematic description of the chemistry of the main group elements based on fundamental chemical principles. Fundamental techniques of inorganic synthesis. Class, three hours a week.

Prerequisite: Chm 116.

CHM 231. ORGANIC CHEMISTRY I **Four credits**

An introduction to the chemistry of carbon compounds which develops the theoretical principles underlying the mysterious "vital force" from which all organic materials were supposedly derived. These principles will be investigated and applied in the laboratory. Class, three hours a week; laboratory, three hours a week; pre-lab session, one hour a week. Fee: $35.

Prerequisite: Chm 116 or Chm 118.

CHM 232. ORGANIC CHEMISTRY II **Four credits**

A continuation of Chm 231 with emphasis on modern organic syntheses. The laboratory integrates syntheses, isolation, analysis, and instrumentation. Class, three hours a week; laboratory, three hours a week; pre-lab session, one hour a week. Fee: $35.

Prerequisite: Chm 231.

CHM 241. INORGANIC QUANTITATIVE ANALYSIS **Four credits**

An introduction to the theory and practice of typical analyses: volumetric, gravimetric, and instrumental. Class, two hours a week; laboratory, six hours a week; pre-lab session, one hour a week. Fee: $45.

Prerequisite: Chm 116.

CHM 251. PHYSICAL CHEMISTRY I **Four credits**

The first and second laws of thermodynamics are developed, leading to an emphasis on the applications of the free energy concept: electrochemistry, the phase rule, and colligative properties. Chemical kinetics is introduced. Class, three hours a week; laboratory, three hours a week. Fee: $35.

Prerequisites: Chm 116, Mth 106 or Mth 211, Phy 106 or Phy 202.

CHM 252. PHYSICAL CHEMISTRY II **Four credits**

Elementary quantum theory, kinetic molecular theory, and nuclear chemistry are studied. The molecular orbital theory and other approximate methods of quantum theory are developed. Statistical mechanics and surface chemistry are introduced. Class, three hours a week; laboratory, three hours a week. Fee: $35.

Prerequisite: Chm 251.

CHM 272. CHEMICAL STRUCTURE DETERMINATION **Three credits**

A study of structure determination techniques with emphasis on organic, inorganic, and biochemical molecules. Techniques include nuclear magnetic resonance, infrared, ultraviolet, visible, and mass spectroscopy, with applications of group theory to spectroscopic investigations. Class, one hour a week; laboratory, six hours a week. Fee: $45.

Prerequisites: Chm 223, 232, 251.

CHM 278. CHEMICAL INFORMATION RETRIEVAL TECHNIQUES **Two credits**

The nature and use of the important sources of chemical information are developed through retrospective searching methods and current awareness concepts. Emphasis is placed on the study of computer-based systems, access to remote commercial databases, the design of personalized database computer files. Information search strategies, and supplemental manual search procedures. Literature preparation for Independent Research (Chm 395-396) is included. Class, one hour a week; computer and library laboratory, three hours a week.

Prerequisite: Permission of instructor.

CHM 323. ADVANCED INORGANIC CHEMISTRY **Four credits**

Introduction to ligand field theory; chemistry of the first transition series, organometallic, and Π acceptor compounds; mechanisms of inorganic reactions. Class, three hours a week; laboratory, three hours a week. Fee: $45.

Prerequisites: Chm 223 and 252.

CHM 346. POLYMER CHEMISTRY **Three credits**

Introduction to high polymers as an engineering material and the mechanical, electrical, and optical properties of polymers. Class, three hours a week. (same as MaE 332)

Prerequisite: Junior or senior standing.

CHM 361. BIOCHEMISTRY I **Three credits**

A study of the physical and chemical properties of biological molecules with emphasis on physical methods of biochemistry, proteins, enzyme kinetics, bioenergetics, nucleic acids, and carbohydrates.

Prerequisite: Chm 232.

CHM 362. BIOCHEMISTRY II **Three credits**

A study of metabolism with emphasis on metabolic regulation.

Prerequisite: Chm 232.

CHM 363. BIOCHEMISTRY **Four credits**

A study of the physical and chemical properties of biological molecules with emphasis on physical methods of biochemistry, proteins, enzyme kinetics, bioenergetics, nucleic acids, and carbohydrates. Class, three hours a week; laboratory, three hours a week. Fee: $45.

Prerequisite: Chm 232.

CHM 391. SENIOR RESEARCH I **One credit**

Plan and carry out a selected chemistry research project under the direction of a faculty member. It is expected that this project will be a laboratory research project.

Prerequisite: Senior standing in a Chemistry curriculum.

CHM 392. SENIOR RESEARCH II **Two credits**

Carry out a selected chemistry research project under the direction of a faculty member. It is expected the project will be a laboratory research project. The project must culminate in a written report and the results must be presented at a Department Seminar.

Prerequisite: Chm 391.

CHM 395-396. INDEPENDENT RESEARCH **One to three credits each**

Independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required. Cannot be taken for credit before the seventh semester but may be a continuation of work begun before the seventh semester. Fee: one credit $25, two credits $35, three credits $45.

Prerequisite: Chm 278.

CHM 397. SEMINAR **Zero or one credit**

Presentations and discussions of selected topics in chemistry conducted by senior chemistry majors, staff, and visiting lecturers. Freshman and sophomore chemistry majors are encouraged to attend. Junior and Senior Chemistry majors are required to participate.

Prerequisite: Approval of department chairperson is required.

CHM 398. TOPICS **One to three credits**

A study of topics of special interest, such as advanced physical chemistry, advanced analytical chemistry, advanced organic chemistry, surface and colloid chemistry, nuclear chemistry, chemical kinetics, or spectroscopy.

CHM 399. COOPERATIVE EDUCATION **Three or six credits**

Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)

Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

Students without the indicated prerequisites for 200- and 300-level chemistry courses may enroll after written permission of the instructor has been approved by the department chairperson.



COMPUTER INFORMATION SYSTEMS

Professor Merrill, Chairperson.

Total minimum number of credits required for a major in Computer Information Systems leading to the B.S. degree — 123.

Total minimum number of credits required for a minor in Management Information Systems — 21.

An interdisciplinary program leading to the B.S. degree with a major in Computer Information Systems is offered by the Department of Mathematics and Computer Science, in cooperation with the School of Business and Economics. Also available is a minor in Management Information Systems. (Students majoring in Computer Information Systems are **not** permitted to obtain a minor in Management Information Systems.)

Major in Computer Information Systems

The CIS program is concerned mainly with the use of computer systems in business and industrial organizations. Its principal subject matter includes the study of systems analysis, systems design and computer programming, along with other analytical and business areas which are pertinent to the development, implementation, and maintenance of information systems. Required courses for a Computer Information Systems major are indicated in the curriculum outline recommended below.

Minor in Management Information Systems

Required courses:	credit hours
CS 124, 224, 324, 325	12
BA 251	3
Any two among:	
BA 252, 254, 256	6
Total	21

Recommended Course Sequence for a Major in Computer Information Systems

NOTE: All core requirements should be chosen to satisfy the General Core Requirements listed on pages 57-60.

First Semester

Eng 101 Composition I	3
CS 115 Survey of Computers & Data Processing	3
Mth 105 Calculus for Life, Managerial, and Social Sciences I	4
Core Requirements	6
CST 101 Core Studies I	1
PE 100 Activity	0
	17

Second Semester

Eng 102 Composition II	3
CS 125 Computer Science I	3
Mth 106 Calculus for Life, Managerial, and Social Sciences II	4
Core Requirements	6
PE 100 Activity	0
	16

Third Semester

CS 124 Introduction to Business Programming: COBOL	3
BA 251 Principles of Management	3
Acc 121 Elementary Accounting I	3
Mth 150 Elementary Statistics	3
Core Requirement	3
	15

Fourth Semester

CS 224 File Management: COBOL	3
BA 252 Operations and Systems Management	3
Acc 122 Elementary Accounting II	3
Core Requirements	6
	15

Fifth Semester

CS 324 Systems Analysis	3
BA 225 Managerial Finance	3
Core Requirements	6
Free Elective	3
	15

Sixth Semester

CS 325 Database Management	3
BA 222 Marketing	3
Core Requirements	6
Free Elective	3
	15

Seventh Semester

CS/Mth Elective*	3
SCT 101 Public Speaking	3
Eng 202 Technical Writing	3
Free Electives	6
	15

Eighth Semester

CS/Mth Elective*	3
BA 254 Organizational Design & Behavior (or)	3
BA 256 Business Policies & Corporate Responsibility	
Free Electives	9
	15

*CS/Mth electives must include two of the following: CS 260, CS 262, CS 321, CS 335, or Mth 354.

Summary of Minimum Credit Distribution for the CIS Major:

	credit hours
CS 115, 124, 125, 224, 324, and 325	18
Mth/CS Electives*	6
Acc 121-122, BA 222, 225, 251, and 252	18
BA 254 or BA 256	3
Mth 105, 106, and 150	11
Eng 101-102	6
Eng 202	3
COM 101	3
Core Requirements	34
Free Electives	21
Total	123

*CS/Mth electives must include two of the following: CS 260, CS 262, CS 321, CS 335, or Mth 354.



COMPUTER SCIENCE

Professor Merrill, Chairperson; Professors Emeritus Richards, Salsburg; Professors Sours, Tillman, Wong; Associate Professors Berard, Decosmo, Earl, Koch; Visiting Associate Professor Kuhn; Assistant Professors Kugendran, Rosenbaum.

Total minimum number of credits required for a major in Computer Science leading to the B.A. degree — 124.

Total minimum number of credits required for a major in Computer Science leading to the B.S. degree — 126.

Total minimum number of credits required for a minor — 21.

A broad program of study leading to a B.A. or B.S. degree with a major or minor in computer science is offered by the Department of Mathematics and Computer Science. The Department of Mathematics and Computer Science also offers programs in mathematics and statistics (see page 263), and in computer information systems and management information systems (see page 211).

Major in Computer Science

The Computer Science curriculum consists of theoretical as well as application-oriented courses and is based on a strong foundation in mathematics. The B.A. option is intended for those interested in management and social sciences, whereas the B.S. option requires greater concentration in the natural and physical sciences. With appropriate choices of major electives, students can prepare for graduate study and research in the discipline, or for employment in government or industry. Students are encouraged, through the attainment of a minor or second major, to acquire competence in an area that lends itself to meaningful computer applications. Required courses for a computer science major are indicated in the curriculum outlines recommended on page 215, which are based on an extensive prerequisite structure.

With the approval of the department, a student may earn credits in a maximum of five mathematics or computer science courses by passing special challenge examinations. Interested students may obtain further details and application forms from the department chairperson.

Minor in Computer Science

Required Courses:	credit hours
CS 123 or 124, 125, 126, 227	12
Electives: chosen in accordance with either (a) or (b) below:	9
a. CS minor with emphasis on data processing applications — CS 224, 324, 325	
b. general CS minor — CS 230 and any two CS courses numbered above 250	
Total	21

Recommended Course Sequences for a Major in Computer Science

NOTE: All core requirements should be chosen to satisfy the General Core Requirements listed on pages 57-60, except that science electives must be in accordance with the Department's requirements specified on page 216.

First Semester

	B.A.	B.S.
Mth 111 Calculus I	4	4
Eng 101 Composition I	3	3
CS 125 Computer Science I	3	3
Core Requirements	6	6
CST 101 Core Studies I	1	1
PE 100 Activity	0	0
	17	17

Second Semester

	B.A.	B.S.
Mth 112 Calculus II	4	4
Eng 102 Composition II	3	3
CS 126 Computer Science II	3	3
Core Requirements	6	6
PE 100 Activity	0	0
	16	16

Third Semester

	B.A.	B.S.
Mth 202 Set Theory and Logic	4	4
CS 230 Machine Language	3	3
CS 123 Intro. to Scientific Programming: FORTRAN or	3	3
CS 124 Intro. to Business Programming: COBOL		
Core Requirements	6	6
	16	16

Fourth Semester

	B.A.	B.S.
Mth 214 Linear Algebra	3	3
CS 227 Computer Data Structures	3	3
Science Elective[1]	3	3
Core Requirements	6	6
	15	15

Fifth Semester

	B.A.	B.S.
CS Electives[2]	3	6
Science Elective[1]	3	4
Core Requirement	3	3
Free Electives	6	3
	15	16

Sixth Semester

	B.A.	B.S.
CS 319 Principles of Programming Languages[3] or CS Elective[2]	3	3
Science Elective[1]	3	4
Free Electives	9	9
	15	16

Seventh Semester

	B.A.	B.S.
CS Elective[2]	3	3
Free Electives	12	12
	15	15

Eighth Semester

	B.A.	B.S.
CS 319 Principles of Programming Languages[3] or CS Elective[2]	3	3
Free Electives	12	12
	15	15

1 See page 216 for the Department's requirements regarding science electives.
2 See page 216 for the Department's requirements regarding CS electives.
3 CS 319 is offered in alternate years.

Science Electives for Computer Science Majors:

B.A. candidates: Three courses in Biology, Chemistry, Earth and Environmental Sciences or Physics chosen from among those listed on page 59 under the "Scientific World" distribution area. Selections must include two different fields and one course with a laboratory component.

B.S. candidates: Any two courses from one of these departments: Biology, Chemistry, Earth and Environmental Sciences, or Physics,

and

One additional course in Biology, Chemistry, Earth and Environmental Sciences, Physics, EE 342 or any Engineering course not cross-listed in Computer Science. *(All three courses must be numbered above 200 except that Bio 121, 122, Chm 115, 116, or 118 are also acceptable in this requirement.)*

Computer Science Electives for Computer Science Majors:

B.A. candidates: One course from the software group below and two courses from the applications group.

B.S. candidates: One course from each group below.

Theory	Software	Hardware	Applications
CS 323	CS 326	CS 320	CS 260
CS 328	CS 327	CS 329	CS 262
CS 364	CS 325	CS 330	CS 321
	CS 335		CS 324
			CS 367

Summary of Minimum Credit Distribution for Computer Science Majors:

		B.A.	B.S.
Mth 111, 112, 202, and 214		15	15
CS 123 or 124, 125, 126, 227, 230, and 319		18	18
CS Electives		9	12
Science Electives		9	11
Eng 101-102		6	6
Core Requirements		28	28
Free Electives		39	36
	Total	124	126

CS 115. SURVEY OF COMPUTERS AND DATA PROCESSING **Three credits**

Introduction to computers, both large and small, but with emphasis on, and hands-on experience with, personal computers (Macintosh, IBM-PC). Includes a survey of current commercial software (including word processing, a database, and a spread sheet). Not open to students who have prior credit in any 200-level CS course. Computer science majors will not receive credit in their major for CS 115. Fee: $45.

Offered every fall and spring.

CS 123. INTRODUCTION TO SCIENTIFIC PROGRAMMING: FORTRAN **Three credits**

Structured programming, algorithm design, and introduction to programming using FORTRAN 77. The computer is used to solve problems from a variety of fields. Fee: $45. (same as Egr 244)

Prerequisite: Secondary mathematics including geometry and algebra II.

Offered every spring and summer.

CS 124. INTRODUCTION TO BUSINESS PROGRAMMING: COBOL **Three credits**

Introduction to computer programming using the American National Standard Common Business Oriented Language. The computer is used to solve problems commonly found in a business environment. Fee: $45.

Offered every fall, spring, and summer.

CS 125. COMPUTER SCIENCE I **Three credits**

An introduction to the fundamental concepts of computer science, with emphasis on problem solving and algorithm design using the Pascal programming language. Fee: $45. (same as Egr 245)

Prerequisite: Secondary mathematics including geometry and algebra II.

Offered every spring and fall.

CS 126. COMPUTER SCIENCE II **Three credits**

A study of advanced programming techniques (including recursion and manipulation of structured data types and pointer variables) and abstract linear data structures (lists, stacks, and queues). Fee: $45. (same as Egr 246)

Prerequisite: CS 125 (Egr 245).

Offered every spring and fall.

CS 224. FILE MANAGEMENT: COBOL **Three credits**

A study of advanced programming techniques using ANS COBOL. Topics include efficiency techniques, modular programming, table searching, indexed, direct, and relative file techniques. Fee: $45.

Prerequisite: CS 124.

Offered every spring and summer.

CS 227. COMPUTER DATA STRUCTURES **Three credits**

A study of the use of a high-level language to implement complex data structures and their application to sorting and searching. These structures include lists, trees, graphs, networks and storage allocation. Fee: $45. (same as EE 343)

Prerequisite: CS 126/Egr 246.

Offered every spring.

CS 230. MACHINE LANGUAGE **Three credits**

Basic principles of assembly language programming. Computer organization and representation of numbers, strings, arrays, list structures at the machine level. Examples utilize all levels of computer architecture. Fee: $45. (same as Egr 342)

Prerequisite: CS 126/Egr 246.

Offered every fall.

CS 260. LINEAR PROGRAMMING **Three credits**

Graphical linear programming, simplex algorithm and sensitivity analysis. Special L.P. models such as the transportation problem, transshipment problem, and assignment problem. May include integer programming, branch and bound algorithm, geometric programming, goal programming. (same as Mth 260)

Prerequisites: Mth 106 and CS 123 or CS 125.

Offered in the fall semester of odd years.

CS 262. OPERATIONS RESEARCH **Three credits**

A survey of operations research topics such as decision analysis, inventory models, queueing models, dynamic programming, network models, heuristic models, and non-linear programming. (same as Mth 262)

Prerequisites: CS 123 or CS 125; Mth 105-106 or Mth 111-112; and some elementary knowledge of matrices.

Offered every spring.

CS 319. PRINCIPLES OF PROGRAMMING LANGUAGES **Three credits**

A study of the principles that govern the design and implementation of programming languages. Topics include language structure, data types, and control structures. Programming projects will familiarize students with the features of several specific languages, such as Ada, LISP, and PROLOG.

Prerequisite: CS 227.

Offered in the spring semester of even years.

CS 320. LOGIC AND SWITCHING CIRCUITS **Three credits**

Application of Boolean algebra to the design of Number system logic networks, solid-state switching circuits and devices. Minimization techniques to the synthesis of combinatorial switching circuits including AND-OR and NAND-NOR logic. Analysis and synthesis of sequential switching circuits clocked and asynchronous operation. Effect of microelectronic technology on logic design optimization. Fault masking by redundancy techniques. (see EE 341)

Prerequisite: EE 211.

Offered every fall.

CS 321. SIMULATION AND DATA ANALYSIS **Three credits**

Methods of handling large data bases including statistical analysis and computer simulations. The emphasis will be upon discrete simulation models with a discussion of relevant computer languages, SLAM, GPSS, and/or SIMSCRIPT.

Prerequisites: CS 123/Egr 244 or CS 125/Egr 245 and one year of calculus.

Offered in the fall semester of even years.

CS 323. FORMAL LANGUAGES & AUTOMATA THEORY **Three credits**

This course formalizes many topics encountered in previous computing courses. Topics include languages, grammars, finite automata, regular expressions and grammars, context-free languages, push-down automata, Turing machines and computability.

Prerequisites: Mth 202 and CS 126/Egr 246.

Offered in the fall semester of even years.

CS 324. SYSTEMS ANALYSIS **Three credits**

A study of the design and implementation of large computer projects. Special emphasis is placed on applications to business systems.

Prerequisite: CS 224.

Offered every fall.

CS 325. DATABASE MANAGEMENT **Three credits**

Practical experience in solving a large-scale computer problem including determination of data requirements, appropriate data organization, data manipulation procedures, implementation, testing and documentation.

Prerequisite: CS 324.

Offered every spring.

CS 326. OPERATING SYSTEM PRINCIPLES **Three credits**

Analysis of the computer operating systems including Batch, Timesharing, and Realtime systems. Topics include sequential and concurrent processes, processor and storage management, resource protection, processor multiplexing, and handling of interrupts from peripheral devices. (same as EE 344)

Prerequisite: CS 227/EE 343.

Offered in the fall semester of odd years.

CS 327. COMPILER DESIGN **Three credits**

A study of compiler design including language definition, syntactic analysis, lexical analysis, storage allocation, error detection and recovery, code generation and optimization problems.

Prerequisite: CS 227/EE 343.

Offered in the spring semester of odd years.

CS 328. ANALYSIS OF ALGORITHMS **Three credits**

Theoretical analysis of various algorithms. Topics are chosen from sorting, searching, selection, matrix multiplication and multiplication of real numbers, and various combinatorial algorithms.

Prerequisites: CS 227/EE 343 and Mth 202.

Offered in the spring semester of even years.

CS 329. MICROCOMPUTER OPERATION AND DESIGN **Three credits**

Microprocessor architecture, microcomputer design, and peripheral interfacing. Microprogramming, software systems, and representative applications. Associated laboratory experiments consider topics such as bus structure, programming, data conversion, interfacing, data acquisition, and computer control. Two hours lecture and one two-hour laboratory per week. Fee: $45. (see EE 342)

Prerequisite: CS 320/EE 341.

Offered every spring.

CS 330. COMPUTER ARCHITECTURE **Three credits**

A study of the design, organization, and structure of computers, ranging from the microprocessors to the latest "supercomputers." (same as EE 346)

Prerequisite: CS 230/Egr 342 or CS 329/EE 342.

Offered in the spring semester of odd years.

CS 335. ADVANCED DATABASE CONCEPTS **Three credits**

A continuation of CS 325. Concentration on the design of a large scale database system, current special hardware and software, and the role of a DBMS in an organization.

Prerequisite: CS 325.

Offered in the fall semester of even years.

CS 364. NUMERICAL ANALYSIS **Three credits**

Numerical methods of differentiation, integration, solution of equations and of differential equations with emphasis on problems that lend themselves to solution using computers. (same as Mth 364)

Prerequisites: CS 123/Egr 244 or CS 125/Egr 245 and Mth 211 or consent of instructor.

Offered in the spring semester of odd years.

CS 367. COMPUTER GRAPHICS **Three credits**

Introduction to equipment and techniques used to generate graphical representations by computer. Discussion of the mathematical techniques necessary to draw objects in two- and three-dimensional space. Emphasis on application programming and the use of a high-resolution color raster display.

Prerequisite: CS 227/EE 343.

Offered in the fall semester of even years.

CS 370. SPECIAL PROJECTS **Variable credit**

The definition, formulation, programming, solution, documentation, and testing of a sophisticated problem or project under close faculty supervision. The project will be drawn from industry, business, or governmental agency in the greater Wilkes-Barre area. The student will be expected to present a written report at the conclusion of the project. This course may be taken as part of the Cooperative Education Program. A student may apply at most six credits of CS 370 and a maximum of twelve credits in CS 370 and Cooperative Education 301-302-303-304 toward the graduation requirement in the computer science major.

Prerequisite: Senior standing and approval of department chairperson.

CS 395-396. INDEPENDENT STUDY IN COMPUTER SCIENCE **Variable credit**

Individual study in a chosen area of computer science under the supervision of a faculty member. May be repeated for credit.

Prerequisite: Approval of department chairperson.

CS 399. COOPERATIVE EDUCATION **Three or six credits**

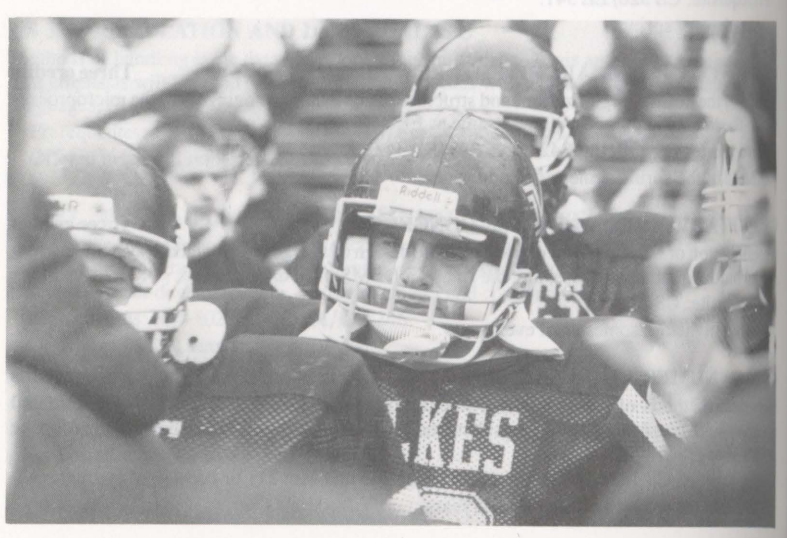
Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)

Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

CS 198/298/398/498. TOPICS IN COMPUTER SCIENCE **Variable credit**

Study of one or more special topics in computer science. May be repeated for credit.

Prerequisite: Varies with topics studied.



EARTH AND ENVIRONMENTAL SCIENCES

Associate Professor Redmond, Acting Chairperson; Professor Cox; Associate Professors M. Case, Klemow, Pindzola, Redmond; Assistant Professors Chabulo, S. Halsor; Adjunct Faculty Smith, Toothill, Winsor; Lab Director Oram; Lab Assistant C. Halsor.

Total minimum number of credits required for a major in Earth and Environmental Science leading to the B.A. — 129.

Total minimum number of credits required for a major in Earth and Environmental Science leading to the B.S. — 131.

Total minimum number of credits required for a minor — 18.

Total minimum number of credits required for a minor in Geology — 18.

The Department of Earth and Environmental Sciences has two major programs, both of which incorporate a strong background in all of the sciences and include extensive laboratory and field experience. The interdisciplinary nature of the department provides the student with a unique breadth of understanding of the principles and concepts of the Earth and Environmental Sciences while emphasizing methods of analysis and experimentation of very complex, dynamic, and interactive quality; cooperative internships with environmental organizations and industries are encouraged.

The major leading to the B.S. degree emphasizes the technical and analytical aspects of the Earth and Environmental Sciences and is designed for those students intending to work as scientists in laboratory, field, or research positions. Students with this degree may enter graduate programs in Geology, Meteorology, and Environmental Science. A related degree in Environmental Engineering is offered by the Engineering Department in conjunction with the EES department.

The major leading to the B.A. degree emphasizes human interactions with the Earth and Environmental Sciences and as such, while still requiring an extensive background in the sciences, includes additional coursework in the social sciences and political science. The student is required to choose an appropriate minor so as to acquire an expertise in areas such as technical writing, business administration, or political science. Students with this degree would be trained to work in Environmental Science policy-making and administration. Another option is to satisfy the requirements leading to a Pennsylvania Secondary Teaching Certificate with certification in Earth and Space Science.

Two minors are offered by the department. A minor can be obtained by students with a demonstrated expertise in Earth and Environmental Sciences or Geology as determined by the faculty of the department. The minimum requirement can be met by students who have completed 18 credits in EES (at least 12 credits at the 200-level or above) but only those course credits for which a student has achieved a grade of 2.0 or higher will count toward this

minimum. Courses counted toward the proposed geology minor could not be used for the existing EES minor; however, since there is no geology major, EES majors, like any other major, could pursue a geology minor.

Recommended Course Sequences for a B.A. Degree in Earth and Environmental Sciences

First Semester	TECHNICAL WRITING	POLITICAL SCIENCE	BUSINESS ADMIN.	EARTH & SPACE SCIENCE ED.
Eng 101 Composition	3	3	3	3
Mth 105 Intro. to Calculus I	4	4	4	4
EES 121 Technological Survival	3	3	3	3
PE 100 Activity	0	0	0	0
Bio 121 Modern Biology I	4	4	4	–
Ec 101 Economics I	–	–	3	–
PS 102 Intro. to American Politics	–	3	–	–
Ed 101 Practicum in Education	–	–	–	1
Psy 101 General Psychology I	–	–	–	3
CST 101 Core Studies I	1	1	1	1
Core Requirement	3	–	–	3
	18	18	18	18
Second Semester				
Eng 102 Composition	3	3	3	3
EES 240 Principles of Environmental Sci.	4	4	4	4
PE 100 Activity	0	0	0	0
Bio 122 Modern Biology II	4	4	4	–
Ec 102 Economics II	–	–	3	–
PS 105 Comparative Government	–	3	–	–
Ed 102 Practicum in Education	–	–	–	1
Psy 221 Developmental Psychology	–	–	–	3
Core Requirements	6	3	3	6
	17	17	17	17
Third Semester				
EES 211 Physical Geology	4	4	4	4
Egr 181 CADD Lab	1	1	1	–
Phy 105 Introductory Physics	4	4	4	4
Acc 121 Introductory Financial Accounting	–	–	3	–
Eng 151 Western World Literature I	3	–	–	–
Ed 201 Intro. to Education	–	–	–	3
PS 218 Intro. to Public Administration	–	3	–	–
Core Requirement	3	3	3	3
	15	15	15	14

Fourth Semester	TECHNICAL WRITING	POLITICAL SCIENCE	BUSINESS ADMIN.	EARTH & SPACE SCIENCE ED.
EES 230 Ocean Science	4	4	4	4
EES 212 Historical Geology	–	–	–	3
Phy 106 Introductory Physics	4	4	4	4
Acc 122 Intro. to Managerial Accounting	–	–	3	–
Ed 202 Educational Psychology	–	–	–	3
Ed 203i Special Methods of Teaching in the Sciences	–	–	–	3
Eng 152 Western World Literature II	3	–	–	–
Statistics or Computer Science Elective	3	3	3	–
Core Requirements	3	6	3	–
	17	17	17	17
Fifth Semester				
Chm 115 Elements & Compounds	4	4	4	4
EES 251 Synoptic Meteorology	4	4	4	4
BA 251 Principles of Management	–	–	3	–
Eng 201 Advanced Composition	3	–	–	–
Statistics or Computer Science Elective	–	–	–	3
PS Elective	–	3	–	–
Core Requirements	6	6	6	6
	17	17	17	17
Sixth Semester				
EES Electives	6	6	6	6
EES 194 Field Study	1	1	1	1
EES 252 Climatology	–	–	–	3
BA 254 Organizational Design & Behavior	–	–	3	–
Eng 202 Technical Writing	3	–	–	–
PS 354 Administrative Law & Policy	–	3	–	–
Core Requirements	6	6	6	6
	16	16	16	16

	TECHNICAL WRITING	POLITICAL SCIENCE	BUSINESS ADMIN.	EARTH & SPACE SCIENCE ED.
Seventh Semester				
EES 391 Senior Projects I	1	1	1	–
Ed 371 The Individual in the Classroom	—	—	—	3
Ed 380 Professional Semester in Education	—	—	—	15
Eng 203 Creative Writing	3	—	—	–
SCT 101 Fundamentals of Public Speaking	3	3	—	–
PS Elective	—	3	—	–
BA Elective	—	—	3	–
EES Elective	3	3	3	–
English Elective	3	—	—	–
Free Elective	3	3	3	–
Core Requirements	—	3	6	–
	16	16	16	18
Eighth Semester				
EES 392 Senior Projects II	2	2	2	2
EES 280 Principles of Astronomy	—	—	—	4
PS Elective	—	3	—	–
BA Elective	—	—	3	–
EES Elective	3	3	3	3
Eng 391 Projects in Writing	3	—	—	–
Free Elective	3	3	3	–
Statistics or Computer Science Elective	3	3	3	3
Core Requirement	—	—	—	3
	14	14	14	15
Total Minimum Credits for B.A.	**129**	**129**	**129**	**132**

NOTE — All B.A. degree candidates are required to complete an appropriate minor or teaching certification as above (others may be considered by the department). The Earth & Space Science Teaching Certification program has additional non-course requirements.

Recommended Course Sequence for a B.S. Degree in Earth and Environmental Sciences

First Semester		Second Semester	
Eng 101 Composition I	3	Core Requirement	3
Bio 121 Modern Biology I	4	Bio 122 Modern Biology II	4
Mth 111 Calculus I	4	Mth 112 Calculus II	4
EES 121 Technological Survival	3	EES 240 Environmental Science	4
Egr 181 CADD Lab	1	PE 100 Activity	0
CST 101 Core Studies I	1		15
PE 100 Activity	0		
	16		

Third Semester		Fourth Semester	
EES 211 Physical Geology	4	EES 230 Ocean Science	4
Statistics or Computer Science Elective	3	Statistics or Computer Science Elective	3
Phy 105/201 Introductory Physics	4	Phy 106/202 Introductory Physics	4
Core Requirements	6	Core Requirements	6
	17		17

Fifth Semester		Sixth Semester	
Chm 115 Elements & Compounds	4	Chm 116 Chemical Reaction	4
EES 251 Synoptic Meteorology	4	EES Electives	6
Phy 221 Instrumentation	3	EES 194/394 Field Study	1
Free Elective	3	Eng 102 Composition II	3
Core Requirement	3	Core Requirement	3
	17		17

Seventh Semester		Eighth Semester	
EES 391 Senior Projects I	1	EES 392 Senior Projects II	2
EES Elective	3	EES Electives	5
Core Requirements	6	Core Requirements	6
Free Electives	6	Free Elective	3
	16		16

NOTE – B.S. candidates are encouraged to complete a science minor. For example, a Physics minor includes 18 credits of Physics above the 200 level which can be met by taking the PHY 201, 202, 203 introductory sequence instead of PHY 105, 106 and by taking the required PHY 221 and PHY 225 (EES 251). Candidates are also encouraged to have relevant Co-op experience, 6 credits of which may count as EES electives.

Courses at the 200 level and above are intended for science and math majors only. Exceptions by permission of the instructor. Election of a 200-level course by a non-science major will preclude registration for the corresponding 100-level course.

EES 110. SURVEY OF ASTRONOMY **Three credits**
Topics covered include stars, constellations, galaxies, sun, planets, and satellites. Intended for non-science majors. Two hours lecture and two hours laboratory/recitation. Fee: $35.

EES 115. SURVEY OF GEOLOGY **Three credits**
Topics covered include origin of earth, rocks and minerals, earthquakes, volcanoes, and continental motion. Intended for non-science majors. Two hours lecture and two hours laboratory/recitation. Fee: $35.

EES 120. SURVEY OF METEOROLOGY **Three credits**
Topics covered include temperature, precipitation, wind, weather maps, weather phenomena, and climate. Intended for non-science majors. Two hours lecture and two hours laboratory/recitation. Fee: $35.

EES 121. TECHNOLOGICAL SURVIVAL **Three credits**
An introduction to the techniques of analysis and problem solving in engineering and the sciences. Also a presentation and discussion of scientific and technical world views. Emphasis on visualization with symbolic, verbal, and written communication. Introduction to selected mathematical topics including vectors and matrices. Modeling, examples of physical law, engineering design, and problem solving using computers. Selected current topics with technical merit or likely impact on the future, and a cooperative design project. Three hours lecture/recitation per week.
Prerequisite: Familiarity with Algebra and Geometry.

EES 125. SURVEY OF OCEANOGRAPHY **Three credits**
Topics covered include water properties, currents, waves, marine life, and beaches. Intended for non-science majors. Two hours lecture and two hours laboratory/recitation. Fee: $35.

EES 130. ENVIRONMENTAL AWARENESS **Three credits**
Topics covered include ecology, natural resources, pollution, and global food, energy, and population problems. Intended for non-science majors. Two hours lecture and two hours laboratory/recitation. Fee: $35.

EES 194. INTRODUCTION TO FIELD STUDY **One credit**
An introduction to on-site application of field procedures and investigative techniques. One hour lecture, plus field trip. Fee: variable.

EES 211. PHYSICAL GEOLOGY **Four credits**
Description, analysis, and laboratory studies of earth materials, structures, and processes, including earth's surface, interior, age, and origin. Three hours lecture and three hours laboratory. Fee: $40. **(For science majors only)**

EES 212. HISTORICAL GEOLOGY **Three credits**
A study of the geologic record of the earth's formation and evolution, including methods of dating. Two hours lecture and two hours laboratory.
Prerequisite: EES 211 or consent of instructor.

EES 230. OCEAN SCIENCE **Four credits**
An interdisciplinary approach to the study of the fundamentals of oceanography emphasizing physical, chemical, and biological interrelationships. Three hours lecture and three hours laboratory. Fee: $40. **(For science majors only)**

EES 240. PRINCIPLES OF ENVIRONMENTAL SCIENCE **Four credits**
A study of living systems as they are integrated with their physical environments and impacted by human activity. Three hours lecture and three hours laboratory. Fee: $40. **(For science majors only)**

EES 251. SYNOPTIC METEOROLOGY **Four credits**
Topics include surface and upper-air weather systems, weather phenomena, climate, and local weather influences. Synoptic map analysis and interpretation are emphasized. Three hours lecture and three hours laboratory. Fee: $40. (same as Phy 225) **(For science majors only)**

EES 252. CLIMATOLOGY **Three credits**
Investigation of controls and classification of climatic patterns. Also, study of data handling techniques, scales of climatic change, and practical applications of climatological results. Three hours lecture.
Prerequisite: EES 251.

EES 280. PRINCIPLES OF ASTRONOMY **Four credits**
Topics include orbital mechanics, results of planetary probes, spectra and stellar evolution, and cosmology. Three hours lecture and three hours laboratory. Fee: $40. (same as Phy 228) **(For science majors only)**

EES 305. HAZARDOUS & SOLID WASTE MANAGEMENT **Three credits**
Assessment of the scope of the hazardous and solid waste problem and engineering and management strategies. Lecture topics will include: case histories; groundwater pollution; regulations; human health effect; chemical, biological, thermal, and physical management strategies; and pollution abatement engineering. Three hours lecture.
Prerequisites: Chm 116 or 118 and EES 240.

EES 315. SOILS SCIENCE **Three credits**
A study of the structure, properties, and classification of soils. Fundamental concepts of soils science are applied to the environmental management of terrestrial ecosystems. Topics include a modern perspective on soil; genesis, classification, and physical properties of soils; organic and inorganic nutrient chemistry; soil moisture relationships; and erosion, sedimentation, and land-use management concepts in selected biomes. Measurements are made both in the field and the laboratory. Two hours lecture and three hours laboratory per week. Fee: $40. Offered every other year.
Prerequisites: Chm 115 and EES 211.

EES 317. ECOLOGY **Three credits**
Ecology examines contemporary ecological thinking as it pertains to the interrelationships of organisms and their environments. Interactions at the population and community level are emphasized. Lecture, two hours; laboratory, three hours a week. Laboratory fee: $35.
Prerequisites: Bio 121-122, 223-224, or permission of instructor.

EES 320. HYDROLOGY **Three credits**
The physical elements and processes which constitute the hydrologic cycle are examined. Topics include floods and flood control, water resources, water uses, and ground water pollution problems. Two hours lecture and two hours laboratory. Fee: $40.
Prerequisite: EES 211.

EES 325. DYNAMIC METEOROLOGY **Three credits**
Topics include themodynamics; heat, moisture, and momentum transfer; and atmospheric forces and motion fields. Three hours lecture and one hour discussion.
Prerequisites: EES 251, Mth 105 or 111, or permission of instructor.

EES 330. ADVANCED WATER QUALITY MEASUREMENTS **Four credits**
A study of sources, transport, and effects of aquatic pollutants and disruptions of natural biogeochemical cycles. Lecture topics include distribution of dissolved substances, carbonate and metal equilibria, eutrophication, wastewater engineering, pesticide and oil pollution, radiochemistry of water, thermal water pollution, aquatic toxicology, and groundwater pollution. Training in instrumentation, analytical techniques, sampling and computer data reduction

methods used in monitoring and assessing water and soil pollution. Measurements are made both in the laboratory and the field. Two hours lecture and 6 hours laboratory per week. Fee: $50.

Prerequisites: Chm 115 and 116 (or 118), EES 240.

EES 331. ADVANCED AIR QUALITY MEASUREMENTS — **Four credits**

A study of atmospheric pollutants, their sources and effects. Lecture topics include primary and secondary pollutants, stability and plume behavior, modeling, monitoring, standards, radiation, and air pollution abatement technology and engineering. Analytical procedures, instrumentation and data analysis used in monitoring and assessing air pollution and environmental health. Measurements are performed in the field and the laboratory. Two hours lecture and 6 hours laboratory per week. Fee: $50.

Prerequisites: Chm 115 and 116 (or 118), EES 251 and 240.

EES 340. LIMNOLOGY — **Three credits**

A study of the chemical, physical, and biological aspects of freshwater systems. Laboratory investigations will consist of in-depth analyses of local lakes and streams. Two hours lecture and two hours laboratory. Fee: $40.

Prerequisite: Consent of instructor.

EES 370. GEOMORPHOLOGY — **Three credits**

Land forms, their evolution, and the human role in changing the surface of the earth, utilization of geologic and hydrologic information, and field investigations. Two hours lecture and two hours laboratory. Fee: $40.

Prerequisites: EES 211 and 320.

EES 375. GEOCHEMISTRY — **Three credits**

Chemical properties of earth materials. Origin and abundance of the chemical elements and their distribution. Mineral equilibria. Stable and radioactive isotope variations due to geologic processes. Two hours lecture and two hours laboratory. Fee: $40.

Prerequisites: EES 211 and Chm 116, or consent of instructor.

EES 381. MINERALOGY — **Three credits**

Ionic structure of minerals; physical properties and external form as consequences of structure; determination of minerals by physical tests. Two hours lecture and two hours laboratory. Fee: $40.

Prerequisites: EES 211 and Chm 111 or 115.

EES 382. PETROLOGY — **Three credits**

A study of the identification, classification, composition, genesis, and alteration of igneous, sedimentary, and metamorphic rocks and their relation to crustal processes and environments. Two hours lecture and two hours laboratory. Fee: $40.

Prerequisites: EES 211 and 381.

EES 385. FIELD BOTANY — **Three credits**

This is a specialized summertime field course which emphasizes a taxonomic, phylogenetic, and ecological survey of higher plants indigenous to Northeastern Pennsylvania. Due to the extensive field work, enrollment is somewhat more restricted than in other courses; therefore, written permission from the instructor is the prime prerequisite of those upperclassmen wishing to register for the course.

Prerequisites: Bio 121-122, 223-224, or permission of instructor.

EES 391. SENIOR PROJECTS I — **One credit**

Design and development of selected projects in earth and environmental sciences and other related fields under the direction of a staff member. Technical as well as economical factors will be considered in the design. A professional paper and detailed progress report are required.

Prerequisite: Senior standing in EES.

EES 392. SENIOR PROJECTS II — **Two credits**

Design and development of selected projects in earth and environmental sciences and other related fields under the direction of a staff member. Technical as well as economical factors will be considered in the design. A professional paper to be presented and discussed in an open forum is required.

Prerequisite: EES 391 or approval of the instructor.

EES 393. PROFESSIONAL OFF-CAMPUS STUDY — **One to six credits**

This course is intended for students affiliated with the Cooperative Education Program. Students will present a written and oral report to the department faculty and guests at the conclusion of their project. Course may be repeated (with a maximum of six credits applied toward graduation).

Prerequisites: Senior standing and approval of department advisor and chairperson.

EES 394. ADVANCED FIELD STUDY — **One to three credits**

On-site study of an earth or environmental problem or situation incorporating field documentation and investigation techniques. May be repeated for credit when no duplication of experience results. One hour lecture, plus field trip(s). Fee: variable.

Prerequisite: EES 194 or equivalent experience.

EES 395-396. INDEPENDENT RESEARCH I & II — **One to three credits each**

Independent study or research of a specific earth or environmental science topic at an advanced level under the direction of a departmental faculty member. For three credits, a defensible research paper is required.

Prerequisites: Upper-class standing and approval of academic advisor, research advisor, and department chairperson.

EES 397. SENIOR SEMINAR — **One to three credits**

Presentations and discussions of selected topics and projects.

Prerequisite: Senior standing.

EES 399. COOPERATIVE EDUCATION — **Three or six credits**

Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)

Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

EES 198/298/398. TOPICS IN EES — **Variable credit**

Departmental courses on topics of special interest, not extensively treated in regularly scheduled offerings, will be presented under this course number on an occasional basis. May be repeated for credit.

Prerequisite: Varies with topic studied.

EES 498. ADVANCED TOPICS — **One to three credits**

Departmental courses on advanced topics of special interest, not extensively treated in regularly scheduled offerings, will be presented under this course number on an occasional basis. Available for either undergraduate or graduate credit. May be repeated for credit.

Prerequisite: Senior or graduate standing.

ENGINEERING

Associate Professor Armand, Chairperson; Professor Emeritus Thomas; Professors Arora, Faut, Hostler, Kaska, Orehotsky; Associate Professors Ahmad, Choudhry, Ghorieshi, Maxwell, Pindzola, Razavi, Yeroushalmi; Assistant Professors Bamford, Choe, Farooq, Janecek, Kalim, Kucirka, Lee, Misra, Mohseni, Srinivasan; Adjunct Faculty Fredrick, Osadchy; CADD Manager Petyak; Technical Support Staff: Chesny, Lennox, Sarnecki, Sickler.

Total minimum number of credits required for a major in Applied and Engineering Sciences leading to the B.A. degree — 127.

Total minimum number of credits required for a major in Electrical Engineering leading to the B.S. degree — 137.

Total minimum number of credits required for a major in Environmental Engineering leading to the B.S. degree — 135.

Total minimum number of credits required for a major in Materials Engineering leading to the B.S. degree — 136.

Total minimum number of credits required for a major in Mechanical Engineering leading to the B.S. degree — 134.

Total minimum number of credits required for a major in Engineering Management leading to the B.S. degree — 137.

The Department of Engineering offers four types of degree programs, which provide strong engineering and scientific experience with advanced techniques heavily integrated into the curriculum. Students intending to major in engineering are encouraged to be well prepared in the sciences and mathematics. The first year of course work is common to all engineering programs.

The four-year programs in Electrical Engineering, Engineering Management, Environmental Engineering, Materials Engineering, and Mechanical Engineering leading to the Bachelor of Science degree offer various specializations. Students can choose to concentrate, within these programs, in bioengineering, computer engineering, electronic materials, microelectronics, microwave and antenna systems, or telecommunications. Specialization is achieved through the appropriate selection of the technical electives.

Candidates for the Engineering Management major must declare a preference area in electrical, environmental, or materials. Graduates of this program, with high academic averages, can attain an M.B.A. degree in one year at Wilkes.

The major in applied and engineering sciences is designed to integrate the traditional liberal arts and sciences with technological courses: general collegiate education is stressed including a broad knowledge of basic technological concepts in a humanistic context. This general education is coupled with a specific academic competence in an area pertinent to the career goals of individual students. Individual concentrations within the major are structured from the 72 credits of unspecified core requirements (distribution requirements must be satisfied), science and technology electives, and free electives. A minimum of 15 credits must be completed in a concentration, which may be in a particular discipline or in one of the following interdisciplinary areas: Information Systems, Cognitive Studies, Allied Health, Physical Sciences, Planning & Technology Management, and Environment & Public Policy. Each individual program must be approved by the School's Program Coordinator. The major's structure is flexible enough to permit the completion of a minor or a double major. The major leads to the degree of Bachelor of Arts.

The five-year programs in engineering offer the student the opportunity to obtain broader education in the arts and sciences, while completing the requirements for a major in engineering. Upon successful completion of this program, the student is awarded a B.S. degree in a particular branch of engineering. A student may elect to enter this program at any time during his or her period of study. The timing of this entry is critical, due to the sequential nature of the courses in engineering.

The two-year programs in Aeronautical, Chemical, Civil, and Industrial engineering are also offered. These programs are specifically designed to provide a successful transfer of students to the junior year at other accredited engineering schools.

The student professional chapters of the Institute of Electrical and Electronic Engineers (I.E.E.E.), the American Society for Metals (A.S.M.), the Society of Women Engineers (S.W.E.), American Ceramic Society (ACerS), Metallurgical Society of A.I.M.E., and the Pennsylvania Society of Professional Engineers (P.S.P.E.), in conjunction with the Department, periodically offer seminars on subjects of a timely nature. Attendance at these seminars is mandatory for the completion of degree requirements.

In 1979 the Engineering Department started the Technology Transfer Program (TTP) to enable the community to draw upon the department's technical expertise and advanced facilities. This effort is directed to assist in the development and expansion of industries, and the establishment of high technology facilities in Northeastern Pennsylvania.

Honors Programs in Engineering

Upon the recommendation and approval of the engineering faculty, honor students in Engineering will be recognized upon completion of the following requirements: achieving an overall grade point average of 3.25 or better; receiving grades of 3.00 or better in all engineering courses of his or her discipline; pursuing independent research or special projects in engineering and presenting the results at meetings, conferences, or through publication of a paper. The distinction "Honors in Engineering" will be recorded on the student's transcript upon graduation.

Four-Year Engineering Academic Programs

Recommended Course Sequence for a B.A. Degree with a Major in Applied & Engineering Sciences

First Semester

Eng 101 Composition I	3
Mth 105 Introduction to Calculus I or 111 Calculus I	4
Core Requirement	3
Egr 121 Technological Survival	3
PE 100 Activity	0
CST 101 Core Studies I	1
	14

Second Semester

Eng 102 Composition II	3
Mth 106 Introduction to Calculus II or 111 Calculus II	4
Core Requirement	3
Free Electives	6
PE 100 Activity	0
	16

Third Semester

Chm 115 Elements and Compounds	4
Phy 105 Introductory Physics I or 201 Physics I	4
Egr 181 CADD Lab	1
Core Requirement	3
Free Elective	3
	15

Fourth Semester

Chm 118 Chemistry for Engineers	3
Phy 106 Introductory Physics II or 202 Physics II	4
Computer Science Elective	3
Core Requirement	3
Free Elective	3
	16

Fifth Semester

Phy 221 Electronics Instrumentation	3
ME 231 Statics & Dynamics	3
Science & Engineering Electives	3-4
Core Requirement	3
Free Elective	3
	15-16

Sixth Semester

EE 211 Circuit Theory	3
MaE 210 Materials Engineering	3
Science & Engineering Electives	6
Core Requirement	3
Free Elective	3
	18

Seventh Semester

Egr 391 Senior Project I	1
Soc 391 Social Soundness Analysis I	1
Science & Engineering Electives	9
Core Requirement	3
Free Elective	3
	17

Eighth Semester

Egr 392 Senior Project II	2
Soc 392 Social Soundness Analysis II	2
Science & Engineering Electives	6
Core Requirement	3
Free Elective	3
	16

The Science & Engineering Electives, the Free Electives, and the Core Electives must be selected from a program outline approved and documented in advance by the program coordinator and the student's advisor. One course in the area of project management is required in the senior year. A minimum of six credits is required in 300-level courses in Science and Engineering Electives.

Core Requirements constitute a total of fifteen credits in Culture & Value, three in Artistic Expression, and six in Society & Human Behavior, selected to satisfy the distribution requirements.

Recommended Course Sequence for a B.S. Degree in Electrical Engineering

First Semester

Chm 115 Elements and Compounds	4
Mth 111 Calculus I	4
Egr 121 Technological Survival	3
Egr 181 CADD Lab	1
Eng 101 Composition I	3
CST 101 Core Studies I	1
PE 100 Activity	0
	16

Second Semester

Chm 118 Chemistry for Engineers	3
Mth 112 Calculus II	4
Egr 244 FORTRAN	3
Phy 201 General Physics I	4
Eng 102 English Composition II	3
PE 100 Activity	0
	17

Third Semester

EE 211 Circuit Theory I	3
Mth 211 Intro. to Differential Equations	4
Phy 202 General Physics II	4
ME 231 Statics & Dynamics	3
Egr 283 Measurement Lab I	1
Core Requirement	3
	18

Fourth Semester

EE 212 Circuit Theory II	3
Mth 212 Multivariable Calculus	4
Phy 203 General Physics III	3
ME 232 Strength of Materials or 224 Heat and Mass Transfer	3
Egr 284 Measurement Lab II	1
MaE 210 Materials Engineering	3
	17

Fifth Semester

EE 251 Electronics I	3
EE 253 Electronic Lab I	1
EE 331 Electromagnetics I	3
EE 214 Linear Systems	3
EE Elective	3
Core Requirement	3
	16

Sixth Semester

EE 252 Electronics II	3
EE 254 Electronic Lab II	1
EE 332 Electromagnetics II	3
EE 334 Electromagnetics Lab II	1
EE 272 Solid State Devices	3
EE Elective	3
Core Requirement	3
	17

Seventh Semester

EE 321 Electromechanical Energy Conversion	3
EE 335 Microwaves & Antenna Systems	3
EE 381 Microelectronics Lab	4
EE 391 Senior Projects I	1
EE Elective	3
Core Requirements	4
	18

Eighth Semester

EE 382 Comm. & Antenna Lab	4
EE 392 Senior Projects II	2
EE 323 Machines & Controls Lab	1
EE Elective	3
Core Requirements	8
	18

EE electives may be chosen from any science or engineering course numbered 200 or above, with at least nine credits from three of the following areas: Communications; Computers; Controls; Electronic Materials; Power; Engineering Management (Engineering Management not to exceed 3 credits). Students desiring concentrations should consult their advisor for proper EE electives.

Core Requirements are selected to satisfy the distribution requirement. It is strongly recommended that Soc 391 & 392 be taken along with EE 391 & 392.

Recommended Course Sequence for a B.S. Degree in Engineering Management

First Semester

Chm 115 Elements and Compounds	4
Mth 111 Calculus I	4
Egr 121 Technological Survival	3
Egr 181 CADD Lab	1
Eng 101 Composition I	3
CST 101 Core Studies I	1
PE 100 Activity	0
	16

Second Semester

Chm 118 Chemistry for Engineers	3
Mth 112 Calculus II	4
Egr 244 FORTRAN	3
Phy 201 General Physics I	4
Eng 102 Composition II	3
PE 100 Activity	0
	17

Third Semester

EE 211 Circuit Theory I	3
ME 231 Statics & Dynamics	3
Phy 202 General Physics I	4
Egr 283 Measurement Lab I	1
Mth 211 Intro. to Differential Equations	4
Ec 101 Economics I	3
	18

Fourth Semester

MaE 210 Materials Engineering	3
ME 232 Strength of Materials or 224 Heat and Mass Transfer	3
Egr 284 Measurement Lab II	1
Mth 150 Statistics	3
Acc 121 Intro. to Financial Accounting	3
Core Requirement	3
	16

Fifth Semester

Egr 371 Analysis & Prog. Methods	3
BA 225 Managerial Finance	3
BA 251 Principles of Management	3
Technical Electives	6
Core Requirement	3
	18

Sixth Semester

Egr 376 Engineering & Management Models	3
BA 233 Business Law — Legal Env. or 234 Business Law —	3
Technical Electives	6
Core Requirements	6
	18

Seventh Semester

Egr 391 Senior Projects I	1
BA 222 Marketing	3
Technical Electives	6
Engineering Management Elective	3
Core Requirements	4
	17

Eighth Semester

Egr 392 Senior Projects II	2
EES 240 Principles of Environmental Science	4
Technical Electives	6
Engineering Management Elective	3
Core Requirement	2
	17

Technical Electives must follow the approved engineering and science courses of the declared concentration in Electrical, Environmental, Manufacturing, Materials or Mechanical. Consult your advisor for advanced preference program outline.

Engineering Management Electives may be satisfied by engineering management courses, independent research, or internship.

Core Requirements are selected to satisfy the distribution requirement. It is strongly recommended that Soc 391 & 392 be taken along with Egr 391 & 392.

Recommended Course Sequence for a B.S. Degree in Environmental Engineering

First Semester

Chm 115 Elements and Compounds	4
Mth 111 Calculus I	4
Egr 121 Technological Survival	3
Egr 181 CADD Lab	1
Eng 101 Composition I	3
CST 101 Core Studies I	1
PE 100 Activity	0
	16

Second Semester

Chm 118 Chemistry for Engineers	3
Mth 112 Calculus II	4
Egr 244 FORTRAN	3
Phy 201 General Physics I	4
Eng 102 Composition II	3
PE 100 Activity	0
	17

Third Semester

Mth 211 Intro. to Differential Equations	4
Phy 202 General Physics II	4
Egr 283 Measurement Lab I	1
EE 211 Circuit Theory I	3
ME 231 Statics & Dynamics	3
Core Requirement	3
	18

Fourth Semester

Mth 212 Multivariable Calculus	4
EES 240 Principles of Env. Science	4
Egr 284 Measurement Lab II	1
MaE 210 Materials Engineering	3
ME 224 Heat and Mass Transfer	3
Core Requirement	3
	18

Fifth Semester

Bio 121 Modern Biology I or Chm 231 Organic Chemistry I	4
EES 330 Advanced EQM I or 320 Hydrology	4-3
EES 211 Physical Geology	4
ME 321 Fluid Mechanics	3
Core Requirement	3
	18-17

Sixth Semester

Bio 122 Modern Biology II or Chm 232 Organic Chemistry II	4
EES 331 Advanced EQM II or 305 Hazardous Solid Waste	4-3
ME 232 Strength of Materials	3
Core Requirements	6
	17-16

Seventh Semester

Egr 391 Senior Projects I	1
EES 330 Advanced EQM I or 320 Hydrology	4-3
EES 251 Synoptic Meteorology	4
Technical Elective	6
Core Requirement	1
	16-15

Eighth Semester

Egr 392 Senior Projects II	2
EES 331 Advanced EQM II or 305 Hazardous Solid Waste	4-3
Technical Elective	6
Core Requirements	5
	17-16

Technical Electives are to be chosen from engineering courses numbered 200 or above including MaE 234 or 332, one 300 level EES, and an Engineering Management course. Consult with your advisor for proper biology sequencing and program outline.

Core Requirements are selected to satisfy the distribution requirement. It is strongly recommended that Soc 391 & 392 be taken along with Egr 391 & 392.

Recommended Course Sequence for a B.S. Degree in Materials Engineering

First Semester

Chm 115 Elements and Compounds	4
Mth 111 Calculus I	4
Egr 121 Technological Survival	3
Egr 181 CADD Lab	1
Eng 101 Composition I	3
CST 101 Core Studies I	1
PE 100 Activity	0
	16

Second Semester

Chm 118 Chemistry for Engineers	3
Mth 112 Calculus II	4
Egr 244 FORTRAN	3
Phy 201 General Physics I	4
Eng 102 Composition II	3
PE 100 Activity	0
	17

Third Semester

Mth 211 Intro. to Differential Equations	4
Phy 202 General Physics II	4
EE 211 Circuit Theory I	3
ME 231 Statics & Dynamics	3
Egr 283 Measurement Lab I	1
Core Requirement	3
	18

Fourth Semester

Mth 212 Multivariable Calculus	4
Phy 203 General Physics III	3
ME 224 Heat and Mass Transfer	3
ME 232 Strength of Materials	3
Egr 284 Measurement Lab II	1
MaE 210 Materials Engineering	3
	17

Fifth Semester

Chm 231 Organic Chemistry I	4
MaE 311 X-Ray Diffraction	3-4
or 321 Thermo & Phase Equilibria I	
MaE 241 Physical Metallurgy	3
or 231 Ceramics	
MaE Elective	3
Core Requirement	3
	16-17

Sixth Semester

MaE Elective	3
MaE 332 Engineering Polymers	3
or 322 Thermo & Phase Equilibria II	
MaE 342 Mechanical Metallurgy	3
or 234 Electrochemistry	
EE 272 Solid State Devices	3
Core Requirements	6
	18

Seventh Semester

MaE 311 X-Ray Diffraction	4-3
or 321 Thermo & Phase Equilibria I	
MaE 241 Physical Metallurgy	3
or 231 Ceramics	
MaE 381 Adv. Materials Lab I	3
MaE 391 Senior Projects I	1
MaE Elective	3
Core Requirements	4
	18-17

Eighth Semester

MaE 332 Engineering Polymers	3
or 322 Thermo & Phase Equilibria II	
MaE 342 Mechanical Metallurgy	3
or 234 Electrochemistry	
MaE 392 Senior Projects II	2
MaE Elective	3
Core Requirements	5
	16

MaE electives may be chosen from any science or engineering course numbered 200 or above, with at least six credits in engineering courses including Engineering Management (Engineering Management not to exceed 3 credits). Students desiring electronic materials concentration should select the sequence EE 251, 253, and 381.

Core Requirements are selected to satisfy the distribution requirement. It is strongly recommended that Soc 391 & 392 be taken along with MaE 391 & 392.

Recommended Course Sequence for a B.S. Degree in Mechanical Engineering

First Semester

Chm 115 Elements and Compounds	4
Mth 111 Calculus I	4
Egr 121 Technological Survival	3
Egr 181 CADD Lab	1
Eng 101 Composition I	3
PE 100 Activity	0
Core Studies I	1
	16

Second Semester

Chm 118 Chemistry for Engineers	3
Mth 112 Calculus II	4
Egr 244 FORTRAN	3
Phy 201 General Physics I	4
Eng 102 Composition II	3
PE 100 Activity	0
	17

Third Semester

Mth 211 Intro. to Differential Equations	4
EE 211 Circuit Theory I	3
ME 201 Statics & Dynamics	3
Phy 202 General Physics II	4
Egr 283 Measurement Lab I	1
Core Requirement	3
	18

Fourth Semester

Mth 212 Multivariable Calculus	4
Phy 340 Thermodynamics	3
or ME 332 Dynamics & Vibration	
ME 232 Strength of Materials	3
Egr 284 Measurement Lab II	1
MaE 210 Materials Engineering	3
Core Requirement	3
	17

Fifth Semester

ME 211 Introduction to Manufacturing	3
ME 321 Fluid Mechanics	3
ME 323 Fluid Mechanics Lab	1
Phy 221 Electronic Instruments	3
ME Elective	3
Core Requirement	3
	16

Sixth Semester

ME 332 Dynamics & Vibration	3
or Phy 340 Thermodynamics	
ME 224 Heat Transfer	3
ME 226 Heat Transfer Lab	1
EE 314 Control Systems	3
ME Elective	3
Core Requirement	3
	16

Seventh Semester

ME 391 Senior Projects I	1
ME 333 Machine Design	3
ME 315 Computer Integrated	3
Manufacturing	
EE 316 Robotics	3
ME Elective	3
Core Requirements	4
	17

Eighth Semester

ME 392 Senior Projects II	2
ME 384 Mechanical Design Lab	4
Egr 270 Engineering Project Analysis	3
ME Elective	3
Core Requirements	5
	17

ME Electives may be chosen from any science or engineering course numbered 200 or above, with at least 6 credits in engineering. Students desiring concentrations should consult their advisor for proper ME electives.

Core Requirements constitute a total of twelve credits in Culture & Value, three in Creative & Artistic Expression, and three in Society & Human Behavior, selected to satisfy the distribution requirements.

Two-Year Pre-Engineering Academic Programs
Recommended Course Sequence

Aerospace Engineering
Civil Engineering

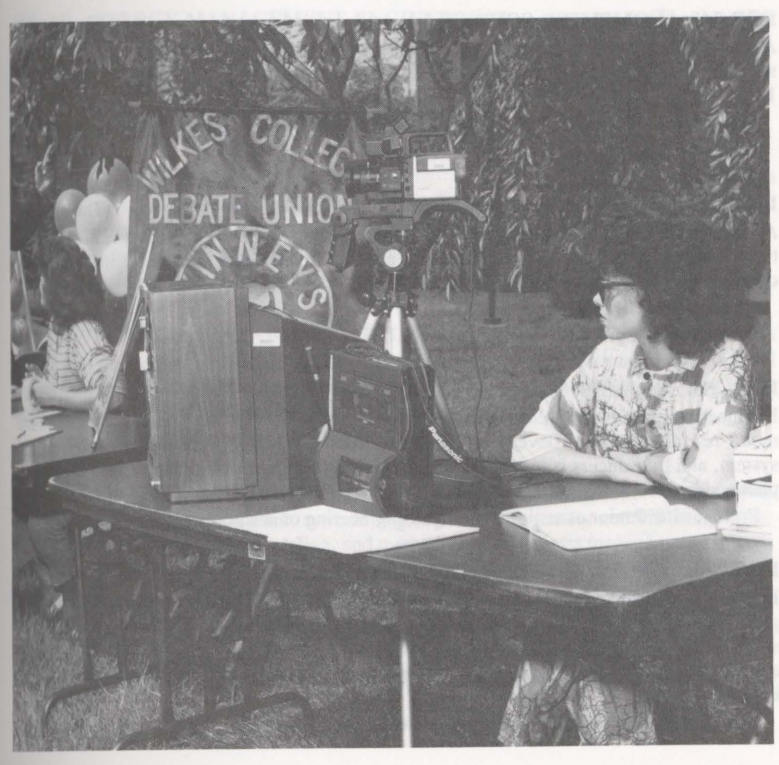
First Semester		Second Semester	
Chm 115 Elements and Compounds	4	Chm 118 Chemistry for Engineers	3
Mth 111 Calculus I	4	Mth 112 Calculus II	4
Egr 121 Technological Survival	3	Egr 244 FORTRAN	3
Egr 181 CADD Lab	1	Phy 201 General Physics I	4
Eng 101 Composition I	3	Eng 102 Composition II	3
PE 100 Activity	0	PE 100 Activity	0
CST 101 Core Studies I	1		
	16		17
Third Semester		**Fourth Semester**	
EE 211 Circuit Theory I	3	ME 232 Strength of Materials	3
ME 231 Statics & Dynamics	3	or 224 Heat and Mass Transfer	
Egr 283 Measurement Lab I	1	Egr 284 Measurement Lab II	1
Mth 211 Intro. to Differential Equations	4	MaE 210 Materials Engineering	3
Phy 202 General Physics II	4	Mth 212 Multivariable Calculus	4
Core Requirement	3	Phy 203 General Physics III	3
		Core Requirement	3
	18		17

Chemical Engineering

First Semester		Second Semester	
Chm 115 Elements and Compounds	4	Chm 118 Chemistry for Engineers	3
Mth 111 Calculus I	4	Mth 112 Calculus II	4
Egr 121 Technological Survival	3	Egr 244 FORTRAN	3
Egr 181 CADD Lab	1	Phy 201 General Physics I	4
Eng 101 Composition I	3	Eng 102 Composition II	3
PE 100 Activity	0	PE 100 Activity	0
CST 101 Core Studies I	1		
	16		17
Third Semester		**Fourth Semester**	
Chm 231 Organic Chemistry I	4	Chm Elective (200 or above)	3-4
EE 211 Circuit Theory I	3	Egr 284 Measurement Lab II	1
Egr 283 Measurement Lab I	1	MaE 210 Materials Engineering	3
Mth 211 Intro. to Differential Equations	4	Mth 212 Multivariable Calculus	4
Phy 202 General Physics II	4	Phy 203 General Physics III	3
Core Requirement	3	Core Requirement	3
	19		17-18

Industrial Engineering

First Semester		Second Semester	
Chm 115 Elements and Compounds	4	Chm 118 Chemistry for Engineers	3
Mth 111 Calculus I	4	Mth 112 Calculus II	4
Egr 121 Technological Survival	3	Egr 244 FORTRAN	3
Egr 181 CADD Lab	1	Phy 201 General Physics I	4
Eng 101 Composition I	3	Eng 102 Composition II	3
PE 100 Activity	0	PE 100 Activity	0
CST 101 Core Studies I	1		
	16		17
Third Semester		**Fourth Semester**	
Mth 211 Intro. to Differential Equations	4	Mth 212 Multivariable Calculus	4
Egr 283 Measurement Lab I	1	Egr 284 Measurement Lab II	1
EE 211 Circuit Theory I	3	BA 252 Operations & Systems Man.	3
ME 231 Statics & Dynamics	3	or Core Requirement	
Phy 202 General Physics II	4	ME 232 Strength of Materials	3
Core Requirement	3	or 224 Heat and Mass Transfer	
		MaE 210 Materials Engineering	3
		Core Requirement	3
	18		17



General Engineering

EGR 121. TECHNOLOGICAL SURVIVAL **Three credits**

An introduction to the techniques of analysis and problem solving in engineering and the sciences. Also a presentation and discussion of scientific and technical world views. Emphasis on visualization with symbolic, verbal, and written communication. Introduction to selected mathematical topics including vectors and matrices. Modeling, examples of physical law, engineering design, and problem solving using computers. Selected current topics with technical merit or likely impact on the future, and a cooperative design project. Three hours lecture/recitation per week.

Prerequisite: Familiarity with Algebra and Geometry.

EGR 181. CADD LAB **One credit**

An introduction to the symbolic and visual languages used in the various engineering fields. The use of the computer in design and drafting and familiarization with various software packages in the CADD (Computer Aided Design and Drafting) laboratory. Blueprint reading and printed circuit layouts. Emphasis will also be placed on the representation and interpretation of data in graphical form as well as the fundamentals of 2-dimensional and 3-dimensional graphic formats. Two hours lecture/laboratory per week. Fee: $15.

Prerequisite: To be taken along with or after Egr 121.

EGR 244. FORTRAN **Three credits**

Introduction to computer programming using the FORTRAN language. The computer is used to solve problems geared to the individual interest of the students. Three hours lecture per week. Fee: $45. (see CS 123)

EGR 245. COMPUTER SCIENCE I **Three credits**

An introduction to the fundamental concepts of computer science, with emphasis on problem solving and algorithm design using the Pascal programming language. Fee: $45. (same as CS 125)

Prerequisite: Secondary mathematics including geometry and algebra II.

Offered every spring and fall.

EGR 246. COMPUTER SCIENCE II **Three credits**

A study of advanced programming techniques (including recursion and manipulation of structured data types and pointer variables) and abstract linear data structures (lists, stacks, and queues). Fee: $45. (same as CS 126)

Prerequisite: CS 125 (Egr 245).

Offered every spring and fall.

EGR 250. BIOMEDICAL ENGINEERING **Three credits**

Engineering principles of biomedical instrumentation relating to circulation, respiration, and motor-neural systems are developed. The relationship between human anatomy, physiological system, and transducers is treated as a man-machine interface phenomenon. Instruments emphasized include X-ray, ultrasonics, and coronary care devices.

Prerequisite: Junior or senior standing in engineering or science.

EGR 270. ENGINEERING PROJECT ANALYSIS **Three credits**

Economic analysis of evaluating cash flows over time. Depreciations: techniques and strategies. Replacement analysis, break even analysis, benefit/cost ratio evaluation. Evaluating a single project-deterministic criteria and techniques. Multiple projects and constraints. Risk analysis and uncertainty. Models of project selections. Project selection using capital asset pricing theory.

Prerequisite: Junior or senior standing in engineering.

EGR 283-284. ENGINEERING MEASUREMENT LAB I, II **One credit each**

A laboratory for the development of measurement techniques and data gathering. The understanding and the use of instrumentation for the measurement of various electric quantities, displacement, temperature, pressure, and other engineering-related quantities. Two-hour laboratory per week. Fee: $30 per semester.

EGR 342. MACHINE LANGUAGE **Three credits**

Basic principles of machine language programming. Computer organization and representation of numbers, strings, arrays, list structures at the machine level. Examples utilize all levels of computer architecture. Three hours lecture. Fee: $45. (see CS 230)

Prerequisite: Egr 246/CS 126.

EGR 360. INDUSTRIAL TRAINING **One to six credits**

Industrial and/or research experience gained through assignments or jobs with the community, government, business, or industry.

Prerequisite: Approval of the Engineering department.

EGR 371. QUANTITATIVE ANALYSIS AND PROGRAMMING METHODS **Three credits**

Discussion of various quantitative analysis and optimization methodologies. Analytical/numerical approaches are used in solving linear and nonlinear optimization problems. Emphasizes the development of ability in analyzing problems, solving problems by using software, and post solution analysis.

Prerequisite: Junior standing or consent of instructor.

EGR 372. ENERGY MANAGEMENT ENGINEERING **Three credits**

Appraisal of energy conservation management, economic efficiency of energy sources, productivity analysis techniques. Principles of energy balance analysis and the availability of energy sources.

Prerequisite: Junior or senior study in engineering or science.

EGR 373. OCCUPATIONAL HEALTH **Three credits**

Appraisal of environmental health hazards, sampling techniques, instrumentation and analytic methods. Principles of substitutions, enclosure and isolation for the control of hazardous operations in industry. Three hours lecture/demonstration.

Prerequisite: Junior or senior standing in engineering or science.

EGR 374. MANAGEMENT OF INDUSTRIAL ENGINEERING **Three credits**

Systems analysis that will include all types of problems frequently encountered by industrial engineers, their impact on the management of an industrial concern, and an exposure to the industrial engineering techniques available to solve the problems.

Prerequisite: Senior engineering standing.

EGR 375. PROJECT & SYSTEMS MANAGEMENT **Three credits**

Description of systems management, systems engineering management and the design process. The role of decision theory, modeling, and methodology in systems management analysis. Project environment and control. Program management, planning, and control.

Prerequisite: Senior engineering standing.

EGR 376. ENGINEERING AND MANAGEMENT MODELS **Three credits**

Discussion of the techniques and arts in modeling practical problems encountered by engineers and managers.

Prerequisite: Egr 371 or consent of instructor.

EGR 391. SENIOR PROJECTS I **One credit**

Design and development of selected projects in the various fields of engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. A professional paper and detailed progress report are required.

Prerequisite: Senior standing in engineering.

EGR 392. SENIOR PROJECTS II **Two credits**

Design and development of selected projects in the field of engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. This is a continuation of Egr 391. A professional paper to be presented and discussed in an open forum is required.

Prerequisite: Egr 391.

EGR 395-396. INDEPENDENT RESEARCH **One to three credits**

Independent study and research for advanced students in the field of their major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.

Prerequisite: Approval of department chairperson.

EGR 397. SEMINAR **One to three credits**

Presentations and discussions of selected topics and projects.

Prerequisite: Senior engineering standing.

EGR 399. COOPERATIVE EDUCATION **Three or six credits**

Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)

Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

EGR 198/298/398. TOPICS IN ENGINEERING **Variable credit**

Selected topics in the field of engineering and related areas. These may include: mechanical engineering; civil engineering; engineering management; geotechnology; radiation; etc.

Prerequisite: Senior engineering standing.

Electrical Engineering

EE 211. CIRCUIT THEORY I **Three credits**

Definitions. Formulations of circuit equations and theorems. Various techniques for circuit analysis using resistive networks. Characterizations of inductance and capacitance. Sinusoidal steady-state analysis using phasor concept. Average power and r.m.s. values. Reactive power, complex power, and power factor. Three phase circuits and their analysis. Measurement of power.

Prerequisite: Mth 112.

EE 212. CIRCUIT THEORY II **Three credits**

Laplace transformation. Transient and steady-state analysis using Laplace transformation. Complex frequency and transform impedances. Definitions of one-port and two-port networks. Network functions, poles and zeros. Frequency responses of second order functions. Inter-relationship between time domain and frequency domain quantities. Mutual inductance and ideal transformer. Characterizations of two-port networks. Fourier series and integral. Computer methods in analysis.

Prerequisite: EE 211.

EE 214. LINEAR SYSTEMS **Three credits**

Types of Signals and Systems: Discrete, Continous Deterministic and Stochastic; Application of Laplace and Z Transforms to System Analysis and Design; Fourier and Discrete Transforms and their application to Communications and Digital Signal Processing with strong treatment of sampling, modulation, and aliasing; Modeling of Electrical, Mechanical, Optical Systems and their analysis using State Space Techniques.

Prerequisite: EE 212.

EE 251. ELECTRONICS I **Three credits**

The development of operating principles and teroinal characteristics of electronic devices, particularly semiconductor devices, rectifiers, amplifiers, design considerations for small and large signals.

Prerequisite: EE 212.

EE 252. ELECTRONICS II **Three credits**

Application of operational amplifiers. Frequency response of amplifiers and principle of feedback. Oscillators, modulation and detection. Design considerations, Logic gates, Flip-Flop Registers and Counters. Principle of digital filters, D/A and A/D converters.

Prerequisite: EE 251.

EE 253. ELECTRONIC LABORATORY I **One credit**

Familiarization with electronic equipment through experiments. Studying the characteristic of diode and transistor through a series of experiments. Design of power supply and different types of amplifiers. One three-hour laboratory a week. Fee: $45.

Prerequisite: To be taken along with or after EE 251.

EE 254. ELECTRONIC LABORATORY II **One credit**

Investigating the effect of negative feedback on characteristics of amplifiers. Experiment with operational amplifier and design of electronic circuits using Op-Amps as a building block. Amplifier design using FET. Switching techniques, multivibrators, flip-flop and other major logic circuits. Design of different type oscillators. Modulation and detection. Each lab group is responsible for the design and demonstration of an engineering project. One three-hour laboratory a week. Fee: $45.

Prerequisite: To be taken along with or after EE 252.

EE 271. PHYSICAL ELECTRONICS **Three credits**

Structure of the solid state, wave mechanics, statistics, band theory of solids, semiconductors and semiconductor electronics. Emission (thermionic, field, and photo-), photoconductivity and luminescene. Diodes, transistors, and other devices. Dielectrics, non-linear optics, piezoelectrics, ferroelectrics, ferro, and ferrimagnetism. Three hours class a week.

Prerequisite: MaE 210, Phy 203.

EE 272. SOLID STATE DEVICES **Three credits**

Basic properties of semiconductors and their conduction processes, with special emphasis on silicon and gallium arsenide. Physics and characterization of p-n junctions. Homojunction and heterojunction bipolar transistors. Unipolar devices including MOS capacitor and MOSFET. Microwave and Photonic devices.

Prerequisite: Basic concepts of Materials Engineering, Modern Physics, including basic quantum and statistical mechanics.

EE 298. TOPICS IN ELECTRICAL ENGINEERING **One to three credits**

Selected topics in the field of electrical engineering.

Prerequisite: Sophomore or junior standing or permission of instructor.

EE 314. CONTROL SYSTEMS **Three credits**

Model of linear systems and general feedback theory. Analysis of closed loop systems using the root locus and frequency response techniques. Stability analysis; the Nyquist stability criterion. Compensating techniques; series and feedback compensation. Sample data system. Introduction to analog computers.

Prerequisite: EE 214.

EE 321. ELECTROMECHANICAL ENERGY CONVERSION **Three credits**

Direct energy conversion: Solar, photovoltaic, thermionic and thermoelectric converters, fuel cells, MHD generators. Electromechanical energy conversion: Magnetic circuits, force and torque in magnetic circuits. Principle of operation, construction and application of transformers, DC machines, synchronous and induction machines. Per unit calculations and power system representation.

Prerequisite: EE 211.

EE 323. MACHINES AND CONTROLS LABORATORY **One credit**

No load and load tests on Transformers, DC Machines, Synchronous Machines, and Induction Motors. Three Phase Transformer Connections, Parallel operation of alternators. Control of DC motors and induction motors using SCRs. Fee $40.

Prerequisite: To be taken along with or after EE 321.

EE 331. ELECTROMAGNETICS I **Three credits**

Vector analysis. The concept of fields. Dielectric and magnetic media; fields in conductors; electric and magnetic circuit elements. Maxwell's equations and boundary condition problems in one, two, and three dimensional space. Plane electromagnetic waves and power flow. Three hours lecture a week. (same as Phy 331)

Prerequisites: Mth 211 and Phy 202.

EE 332. ELECTROMAGNETICS II **Three credits**

Development of Maxwell's equations and boundary-value problems. Plane wave propagation and reflection from boundaries; the Poynting Theorem. Transmission lines and strip lines; impedance transformation and Smith Charts. Guided TEM, TE and TM waves. Radiation from dipole antenna. Three hours lecture a week. (same as Phy 332)

Prerequisite: EE 331/Phy 331.

EE 333. ELECTROMAGNETICS LABORATORY I **One credit**

Laboratory experiments are performed which illustrate fundamental electromagnetic field concepts in distributed systems and in lumped element circuits. Experiments are partially planned by the students and reported both formally and informally. One three-hour laboratory a week. Fee: $40. (same as Phy 333)

Corequisite: EE 331/Phy 331.

EE 334. ELECTROMAGNETICS LABORATORY II **One credit**

Measurements of electrostatic and magnetostatic fields. Slotted line measurements; Standing wave, voltage maximum and minimum, reflection coefficient, VSWR and impedance matching in coaxial and waveguide systems. Measurements of klystron characteristics, optical beam and antenna pattern. One three hour laboratory a week. Fee: $40. (same as Phy 334)

Prerequisites: EE 331/Phy 331, after or along with EE 332.

EE 335. MICROWAVES AND ANTENNA SYSTEMS **Three credits**

Wave propagation in waveguides, resonant cavities and microwave devices and circuits. Retarded potentials. Relation of radiation fields to source distributions; antenna gain concepts and techniques in antenna design. Characterization and analysis of various types of antennas. Radoms and reflectors. Principles of phased-arrays. Three hours lecture a week.

Prerequisite: EE 332.

EE 341. LOGIC AND SWITCHING CIRCUITS **Three credits**

Application of Boolean algebra to the design of Number system logic networks, solid-state switching circuits and devices. Minimization techniques to the synthesis of combinatorial switching circuits including AND-OR and NAND-NOR logic. Analysis and synthesis of sequential switching circuits clocked and asynchronous operation. Effect of microelectronic technology on logic design optimization. Fault masking by redundancy techniques. Three hours lecture a week. (same as CS 320)

Prerequisite: EE 211.

EE 342. MICROCOMPUTER OPERATION AND DESIGN **Three credits**

Microprocessor architecture, microcomputer design, and peripheral interfacing. Microprogramming, software systems, and representative applications. Associated laboratory experiments consider topics such as bus structure, programming, data conversion, interfacing, data acquisition, and computer control. Two hours lecture and one two-hour laboratory a week. Fee: $45. (same as CS 329)

Prerequisite: EE 341/CS 320.

EE 343. COMPUTER DATA STRUCTURES **Three credits**

A study of the use of a high-level language to implement complex data structures. These include lists, trees, graphs, networks, storage allocation, file structure and information storage and retrieval. Three hours lecture a week. Fee: $45. (see CS 227)

Prerequisite: Egr 246.

EE 344. OPERATING SYSTEM PRINCIPLES **Three credits**

Analysis of the computer operating systems including Batch, Timesharing, and Realtime systems. Topics include sequential and concurrent processes, processor and storage management, resource protection, processor multiplexing, and handling of interrupts from peripheral devices. Three hours lecture a week. (see CS 326)

Prerequisite: EE 343/CS 227.

EE 346. COMPUTER ARCHITECTURE **Three credits**

A study of the design, organization, and architecture of computers, ranging from the microprocessors to the latest "supercomputers." (see CS 330)

Prerequisite: Egr 342 or EE 342.

EE 350. MEDICAL INSTRUMENTATION **Three credits**

Applied medical instruments such as ultrasonic devices and signal processing units for ECG and EEG are discussed. The design principles of electrodes, hemodialysis devices, catheters, clinical instruments, intensive care units (ICU's) and pacemakers are treated. Mechanical and electrical design techniques are developed.

Prerequisite: Junior or senior standing in engineering or science.

EE 361. COMMUNICATION SYSTEMS **Three credits**

Fundamental properties of signals. Principles and techniques of linear signal processing. Modulation and demodulation systems, including pulse. Sampling, channel capacity, and coding. Methods of multiplexing. Modulator and multiplexer design. Noise and its effects on communication. Three hours lecture a week.

Prerequisite: EE 214.

EE 376. OPTO-ELECTRONIC ENGINEERING **Three credits**

Wave optics, diffraction, and interference. Lasers and applications including modulation and detection. Optical components and devices. Fiber optics and couplers. Communication and system design concepts. Three hours lecture a week.

Prerequisites: EE 271 and EE 332.

EE 381. MICROELECTRONICS LAB **Four credits**
The theoretical and practical aspects of techniques utilized in the fabrication of semi-conductor devices. Crystal growth, solid solubility, alloying and diffusion, oxide masking and epitaxy. Thin and thick film techniques. Device fabrication procedures in microelectronics, and the electrical performance of devices based on these techniques. Ion implantation system and method of fabrication. One hour lecture and one six-hour lab a week. Fee: $45.

Prerequisite: Senior engineering standing.

EE 382. COMMUNICATION AND ANTENNA LAB **Four credits**
Characterization and measurement of microwave components, devices, and systems. Emphasis on testing and design criteria using swept frequency and dynamic techniques. Network and spectrum analyzers. Antenna radiation pattern measurements using the antenna range test facility. Microwave communication link design and testing. CAD utilization in MW systems. Coherent optical wave generation and modulation. Laser communication. One hour lecture and one six-hour laboratory a week. Fee: $45.

Prerequisite: Senior engineering standing.

EE 391. SENIOR PROJECTS I **One credit**
Design and development of selected projects in the field of electrical engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. A professional paper and detailed progress report are required.

Prerequisite: Senior standing in engineering.

EE 392. SENIOR PROJECTS II **Two credits**
Design and development of selected projects in the field of electrical engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. This is a continuation of the EE 391. A professional paper to be presented and discussed in an open forum is required.

Prerequisite: EE 391.

EE 395-396. INDEPENDENT RESEARCH **One to three credits each**
Independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.

Prerequisite: Approval of department chairperson is required.

EE 397. SENIOR SEMINAR **One to three credits**
Presentations and discussions of selected topics.

Prerequisite: Senior engineering standing.

EE 398. TOPICS IN ELECTRICAL ENGINEERING **Three credits**
Selected topics in the field of electrical engineering. These may include one or more of the following: control systems; information theory; signals and noise measurements; communication systems; network design and synthesis; magnetic and non-linear circuits; digital and analog systems; computer systems; medical engineering; power systems and generation. May be repeated for credit. Three hours lecture each week.

Prerequisite: Junior or senior engineering standing.

EE 399. COOPERATIVE EDUCATION **Three or six credits**
Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)

Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

Materials Engineering

MAE 210. INTRODUCTION TO MATERIALS SCIENCE AND ENGINEERING **Three credits**
Application of materials properties to engineering design. Introduction to atomic arrangements, crystal structures, imperfection, phase diagrams, and structure-property relations. Fundamentals of iron, steel, and non-ferrous materials. The behavior of materials in environmental conditions. Three hours lecture a week.

Prerequisites: Phy 201, 202.

MAE 231. CERAMICS **Three credits**
Structure and properties of ceramic crystalline solids, glasses, and clays. Defect structure, atom movement, interfaces, and ceramic phase diagrams. Processing and engineering application of ceramics. Three hours lecture a week.

Prerequisite: MaE 210.

MAE 234. ELECTROCHEMISTRY **Three credits**
Fundamentals of electrochemistry and the application of electrochemical concepts to corrosion control, battery development, fuel cells, electroplating, and electrolytic industries. Three hours lecture a week.

Prerequisite: MaE 210.

MAE 241. PHYSICAL METALLURGY **Three credits**
Properties of pure metals, constitution, structure, and properties of alloys. Mechanical and thermal treatments of metals and alloys. Influence of microstructure on properties of metals and alloys. Interaction between microstructure, properties, and engineering design. Three hours lecture a week.

Prerequisite: MaE 210.

MAE 298. TOPICS IN MATERIALS ENGINEERING **One to three credits**
Selected topics in the field of materials engineering.

Prerequisite: Sophomore or junior standing or permission of instructor.

MAE 311. X-RAY DIFFRACTION **Four credits**
Study of structure and composition of solids using X-rays. Effects of annealing, substructures, cold work, preferred orientation, and ordering. Principles of design and applications of X-ray diffraction techniques. Three hours lecture and one three-hour laboratory a week. Fee: $45. (same as Phy 323)

Prerequisite: MaE 210.

MAE 321. THERMODYNAMICS AND PHASE EQUILIBRIA I **Three credits**
Fundamentals of thermodynamics. Phase and reaction equilibria. Behavior of gases and solutions. Theory of alloy phases. Thermodynamic approach to phase diagrams and electrochemistry. Electron theory of phase formation. Three hours lecture a week.

Prerequisite: MaE 210.

MAE 322. THERMODYNAMICS AND PHASE EQUILIBRIA II **Three credits**
Fundamentals of thermodynamics. Phase reaction equilibria. Behavior of gases and solutions. Theory of alloy phases. Thermodynamic approach to phase diagrams and electrochemistry. Extractive metallurgical application and laboratory experiments. Two hours lecture and two hours laboratory a week. Fee: $35.

Prerequisite: MaE 321.

MAE 332. POLYMERS **Three credits**
Introduction to high polymers as an engineering material. The mechanical, electrical, and optical properties of polymers and polymer applications. Two hours lecture a week and one two-

hour laboratory a week. Fee: $35. (same as Chm 358)
Prerequisites: MaE 210 and Chm 231.

MAE 342. MECHANICAL METALLURGY **Three credits**
The mechanical properties of materials including: elasticity, plasticity, anelasticity, viscoelasticity, dislocation theory, fracture, fatigue, and deformation of single crystal and polycrystalline materials. Testing and deformation processing of materials. Mechanical properties as engineering design parameters. Two hours lecture and two hours laboratory a week. Fee: $35.
Prerequisite: MaE 210.

MAE 381-382. ADVANCED ENGINEERING LAB I, II **Three credits each**
Topics of commercial importance in materials science and engineering. Instrumentation, experimental techniques, energy conversion, transformations. Research and development laboratory projects, material process and properties. Fee: $45 per semester.
Prerequisite: Senior MaE standing.

MAE 384. MATERIALS DIAGNOSTIC LABORATORY **Three credits**
Study the aggregation, size, and microstructure of the products of high temperature thermochemical reactions and equilibria by microscopy technique, study the microhardness determination technique of ceramographic specimens. Qualitative and quantitative analysis of an alloy or a multi-component oxide. Identification of the components of organic compounds by IR and UR, and NMR. Four point probe electrical conductivity and Hall measurements of semi-conducting materials. Magnetic properties study of perovskite and spinel classes of ferromagnetic compounds. Applications. One hour lecture and one four-hour laboratory a week. Fee: $45.
Prerequisite: MaE 210.

MAE 391. SENIOR PROJECTS I **One credit**
Design and development of selected projects in the fields of materials engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. A professional paper and detailed progress report are required.
Prerequisite: Senior standing in engineering.

MAE 392. SENIOR PROJECTS II **Two credits**
Design and development of selected projects in the field of materials engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. This is a continuation of MaE 391. A professional paper to be presented and discussed in an open forum is required.
Prerequisite: MaE 391.

MAE 395-396. INDEPENDENT RESEARCH **One to three credits each**
Independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.
Prerequisite: Approval of department chairperson is required.

MAE 397. SENIOR SEMINAR **One to three credits**
Presentations and discussions of selected topics.
Prerequisite: Senior standing in engineering.

MAE 398. TOPICS IN MATERIALS ENGINEERING **Three credits**
Selected topics in the field of materials engineering. These may include one or more of the following: X-ray diffraction, structure analysis, phase equilibria, metallurgy, ceramics, physical, mechanical, or electrical properties of materials. May be repeated for credit. Three hours lecture a week.
Prerequisite: Junior or senior engineering standing.

MAE 399. COOPERATIVE EDUCATION **Three or six credits**
Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)
Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

Mechanical Engineering

ME 211. INTRODUCTION TO MANUFACTURING **Three credits**
An introduction to manufacturing focusing on the historical manufacturing processes as well as current topics of interest, such as computer-integrated manufacturing, numerical control, and quality control. Three hours lecture a week.
Prerequisite: Junior standing in engineering or consent of instructor.

ME 213. FACTORY SIMULATION **Three credits**
Introduction to system analysis and simulation, principles of manufacturing systems, and the analysis of discrete computer simulation models. Associated laboratory experiments consider introduction to SIMFACTORY; and design analysis and control of computer simulation model in the factory. Two-hour lecture and two-hour laboratory a week. Fee: $35.
Prerequisite: Junior/senior standing in ME.

ME 214. FLEXIBLE MANUFACTURING SYSTEM **Three credits**
Introduction to CAD/CAM, computer assisted process planning, group technology, manufacturing control by computer, NC/CNC/DNC, programmable controllers, robotics, automation, flexible manufacturing system (FMS), computer integrated manufacturing (CIM). Associated laboratory experiments consider the operation of NC/CNC/DNC, robotics, and FMS. Two-hour lecture and two-hour laboratory a week. Fee: $35.
Prerequisite: Junior/senior standing in ME.

ME 224. HEAT AND MASS TRANSFER **Three credits**
Fundamental principles of heat transmission by conduction, convection and radiation; application of the laws of thermodynamics; mass transfer; application of these principles to the solution of engineering problems. Three hours lecture per week.
Prerequisites: Phy 201 and Mth 211.

ME 226. HEAT TRANSFER LABORATORY **One credit**
Basic heat transfer modes are demonstrated experimentally. This includes conduction, convection, and radiation of heat as well as fin and heat exchanger. One two-hour lab per week. Fee: $35.
Prerequisite: Concurrent with or after ME 224.

ME 231. STATICS AND DYNAMICS **Three credits**
Equilibrium of force systems; computation of reactions and internal forces; determination of centroids and moments of inertia. Kinematics and dynamics of particles and rigid bodies; Newton's laws, kinetics and potential energy, linear and angular momentum, impulse, and inertia properties. Three hours lecture per week. (same as Phy 211)
Prerequisite: Phy 201, Mth 112.

ME 232. STRENGTH OF MATERIALS **Three credits**
Analysis of statically determinate and indeterminate structural systems; computation of reactions, shears, moments, and deflections of beams, trusses, and frames. Bending and torsion of slender bars; buckling and plastic behavior. Three hours lecture per week.
Prerequisite: Egr 231.

ME 234. KINEMATICS **Three credits**
Analytical graphical solutions for displacements, velocities and accelerations in mechanism. Synthesis of linkages and CAMS. Gears and gear trains. Computing mechanisms. Three one-hour lectures per week.
Prerequisite: ME 231.

ME 298. TOPICS IN MECHANICAL ENGINEERING **One to three credits**
Selected topics in the field of mechanical engineering.
Prerequisite: Sophomore or junior standing or permission of instructor.

ME 312. MANUFACTURING SYSTEM ENGINEERING **Three credits**
Fundamentals of Manufacturing Systems, process systems for manufacturing, management systems for manufacturing optimization and economics of manufacturing, automation in manufacturing systems, information systems for manufacturing. Three one-hour lectures.
Prerequisite: Senior standing in ME.

ME 313. PRODUCTION SYSTEM ANALYSIS **Three credits**
Manufacturing planning and control, material requirement planning, capacity planning, shop-floor control, just-in-time in manufacturing, master production scheduling, production planning, demand management, distribution requirements. Three hours lecture a week.
Prerequisite: Junior/senior standing in ME.

ME 315. COMPUTER INTEGRATED MANUFACTURING **Three credits**
The meaning of the "I" in CIM: Data and Operations Integrations. A typical CIM chain. CIM Integration model. The component of CIM: Stages of Development of CIM components; Computer-Aided Design (CAD); Computer-Aided Planning (CAP); Computer-Aided Manufacturing (CAM); Computer-Quality Assurance (CAQ). Interfaces between CIM components. Implementation of CIM: Methods of developing a CIM strategy; CIM prototypes. Further development: Design state cost estimation. Decision support system in CIM. Two one-hour lectures and two hours lab. Fee: $35.
Prerequisite: Senior standing in ME.

ME 316. EXPERT SYSTEMS IN CIM **Three credits**
Design of a prototype expert system using microcomputer to aid in the planning and control of manufacturing systems. Presents a number of computer models to enhance decision making in such areas as forecasting, inventory, production planning, scheduling, material requirement planning, and goal planning. Design of the prototype expert system by combining those models into several knowledge based systems. Two hours lecture and two hours laboratory. Fee: $35.
Prerequisite: Junior/senior standing in ME.

ME 317. QUALITY CONTROL ENGINEERING **Three credits**
Quality control in the manufacturing environment; statistical methods used in quality assurance; statistical process control; acceptance sampling prerequisite. Three one-hour lectures per week.
Prerequisite: Mth 150 or consent of instructor.

ME 321. FLUID MECHANICS **Three credits**
Thermodynamics and dynamic principles applied to fluid behavior, ideal, viscous, and compressible fluids under internal and external flow conditions. (same as Phy 213)
Prerequisite: Egr 231.

ME 323. FLUID MECHANICS LABORATORY **One credit**
Experiments with and analysis of basic fluid phenomena hydrostatic pressure, Bernoulli theorem, laminar and turbulent flow, pipe friction, and drag coefficient. One three-hour lab per week. Fee: $35.
Prerequisite: Concurrent or after ME 321.

ME 325. ENERGY SYSTEMS **Three credits**
Fundamental principles of energy transmission and energy conversion. Comprehension of the physical systems in which the conversion of energy is accomplished. Primary factors necessary in the design and performance analysis of energy systems. Three hours lecture per week.
Prerequisites: Phy 340, ME 224.

ME 326. COMBUSTION ENGINES **Three credits**
Investigation and analysis of internal and external combustion engines with respect to automotive applications. Consideration of fuels, carburetion, combustion, detonation, design factors, exhaust emissions, and alternative power plants. Three one-hour lectures per week.
Prerequisite: Phy 340.

ME 331. STRUCTURAL ANALYSIS AND DESIGN **Three credits**
Stress tensor and analysis of strain. Laws of conservation and basic equations of elastic and viscoelastic bodies. Plane stress and plane strain, theory of extension, torsion and flexure of beams. Introduction to energy methods and elastic stability. Three hours lecture per week.
Prerequisite: ME 232.

ME 332. DYNAMICS & VIBRATION **Three credits**
An introductory course in mechanical vibration dealing with free and forced vibration of single and multi-degrees of freedom for linear and nonlinear systems. Three one-hour lectures per week.
Prerequisites: Mth 211, ME 231.

ME 333. MACHINE DESIGN **Three credits**
A first course in the design of machine elements, dealing with theories of failure, strength and endurance limit, fluctuating stresses, fatigue, design under torsional and combined stresses. Design of bolted connections, fasteners, welds, springs, balled roller bearings, gears, clutches, brakes, belts, and chains. Three one-hour lectures per week.
Prerequisites: ME 232, 332.

ME 335. ENGINEERING MODELING AND ANALYSIS **Three credits**
Introduction to finite element method for static and dynamic modeling and analysis of engineering systems. Finite element formulation and computer modeling techniques for stress, plane strain, beams, axisymmetric solids, heat conduction, and fluid flow problems. Solution of finite element equation and post processing of results for further use in the design problem. Three one-hour lectures per week.
Prerequisites: Egr 244, ME 232.

ME 336. CAE IN MECHANICAL DESIGN **Three credits**
Computer techniques for the design of mechanical systems and components. Engineering software development including computer graphics. System design of individual applications of mechanical and thermal components. Two hour lecture and two hour laboratory. Fee: $35.
Prerequisites: ME 224, 232.

ME 384. MECHANICAL DESIGN LABORATORY **Four credits**
Advanced open-ended laboratory simulating RD&D environment. Emphasis on experimental performance, evaluations, and design. Topics include mechanical system, thermo/fluids, manufacturing processes, and mechanics. One six-hour lab per week. Fee: $45.
Prerequisite: Senior standing in mechanical engineering.

ME 391. SENIOR PROJECTS I **One credit**
Design and development of selected projects in the field of mechanical engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. A detailed progress report is required.
Prerequisite: Senior standing in mechanical engineering.

ME 392. SENIOR PROJECTS II **Two credits**

Design and development of selected projects in the various fields of mechanical engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. A professional paper and detailed progress reports are required. This is a continuation of ME 391. An open-forum presentation and discussion of the professional paper is required.

Prerequisite: ME 391.

ME 395-396. INDEPENDENT RESEARCH **One to three credits**

Independent study and research for advanced students in the field of mechanical engineering under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.

Prerequisite: Senior standing and approval of department chairperson is required.

ME 397. SEMINAR **One to three credits**

Presentations and discussions of selected topics.

Prerequisite: Senior standing or by special departmental permission.

ME 398. TOPICS IN MECHANICAL ENGINEERING **One to three credits**

Selected topics in the field of mechanical engineering. These may include one or more of the following: control systems, automation, robotics, manufacturing systems, solid Mechanics, energy systems, fluid flow, acoustics, computer systems, bio-mechanics. May be repeated for credit.

Prerequisite: Junior or senior engineering standing.

ME 399. COOPERATIVE EDUCATION **Three or six credits**

Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)

Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.



HEALTH SCIENCES — PREPROFESSIONAL AND ALLIED HEALTH PROGRAMS

Dr. Ralph B. Rozelle, Dean of Health Sciences.

Pre-Doctoral Professional Programs in Dentistry, Podiatry, Optometry and Veterinary Medicine

Wilkes University offers pre-professional programs in Dentistry, Podiatric Medicine, Optometry and Veterinary Medicine.

These programs at Wilkes University offer a broad range of choice of academic majors to students. Many major in biology, chemistry or one of the other basic sciences although students have majored in mathematics, engineering, English, etc. and have gained admission to professional school. The schools are generally interested in students who have depth training in the sciences along with a broad background in the humanities and social sciences.

The core basic science requirements for most doctoral professional schools such as dentistry, podiatric medicine, optometry, and veterinary medicine are as follows:

2 courses in biology
4 courses in chemistry (including organic chemistry)
2 courses in physics
2 courses in mathematics (calculus)

The program of study in the pre-doctoral programs follows the semester by semester outline given in other parts of this Bulletin and is listed under the academic majors such as Biology or Chemistry. Any pre-doctoral baccalaureate program of study, however, must include the above basic science prerequisites.

A truly unique feature of Wilkes University for pre-doctoral health science students is an elaborate counselling system. Students are advised by faculty in academic departments, the pre-professional advisor and clinical psychologists. It is the function of these faculty overseers in the advisory system to assure that students are entering a professional field for which they are well-suited and well-prepared, and which they have investigated thoroughly in a professional environment such as a hospital or professional office.

In addition to the ordinary four-year, pre-professional undergraduate programs, Wilkes University has developed distinctive affiliated undergraduate-professional school programs with the following:

Temple University School of Dentistry
Pennsylvania College of Podiatric Medicine
Pennsylvania College of Optometry

The three dual-degree medical programs require only three (3) years of study at Wilkes University before entering professional school. Decisions on admission to the professional school are made by action of a joint selection committee of Wilkes University Faculty and Professional School Faculty following three years of study at Wilkes University. Students enrolling in the affiliated programs will generally follow a program of study which is shown below.

Wilkes University Affiliated Programs in Dentistry/Optometry/Podiatric Medicine

First Semester		Second Semester	
Bio 121 Principles of Modern Biology I	4	Bio 122 Principles of Modern Biology II	4
Chm 115 Elements and Compounds	4	Chm 116 The Chemical Reaction	4
Eng 101 Composition I	3	Eng 102 Composition II	3
Mth 105 Calculus for Life, Managerial, and Social Sciences I **or**		Mth 106 Calculus for Life, Managerial, and Social Sciences II **or**	
Mth 111 Calculus I	4	Mth 112 Calculus II	4
CST 101 Core Studies I	1	Free Electives	0-3
Free Electives	0-2	PE 100 Activity	0
PE 100 Activity	0		15-18
	16-18		

Third Semester		Fourth Semester	
Chm 231 Organic Chemistry I	4	Chm 232 Organic Chemistry II	4
Psy 101 General Psychology	3	Free Electives	11-14
Free Electives	8-11	PE 100 Activity	0
PE 100 Activity	0	Health Profession Orientation	0
	15-18		15-18

Fifth Semester		Sixth Semester	
Phy 105 Introductory Physics **or**		Phy 106 Introductory Physics **or**	
Phy 201 General Physics I	4	Phy 202 General Physics II	4
Free Electives	12-14	Free Electives	12-14
	16-18		16-18

Total electives available [1, 2] . . . . . 40-56 credits

Following successful completion of the three-year program along with one year of basic sciences education at the professional school, Wilkes University will award the Bachelor of Science degree.

[1]Students in the optometry program must take Mth 150 — statistics.
[2] Must include the core educational requirements.

Veterinary Medicine

Students who wish to pursue a career in Veterinary Medicine enroll in a curriculum which will allow them to fulfill the basic science requirements for Veterinary school which are listed below:

2 courses in biology
4 courses in chemistry
2 courses in physics
2 courses in calculus

Many students elect a biology major which would automatically include the above courses. However, students have the option of choosing other majors depending on their interests.

An academic program for a pre-veterinary medicine student would follow a format similar to the following:

First Semester		Second Semester	
Bio 121 Principles of Modern Biology I	4	Bio 122 Principles of Modern Biology II	4
Chm 115 Elements and Compounds	4	Chm 116 The Chemical Reaction	4
Eng 101 Composition I	3	Eng 102 Composition II	3
Mth 105 Calculus for Life, Managerial, and Social Sciences I **or**		Mth 106 Calculus for Life, Managerial, and Social Sciences II **or**	
Mth 111 Calculus I	4	Mth 112 Calculus II	4
CST 101 Core Studies I	1	Free Electives*	0-3
Free Electives*	0-2	PE 100 Activity	0
PE 100 Activity	0		15-18
	16-18		

Third Semester		Fourth Semester	
Chm 231 Organic Chemistry I	4	Chm 232 Organic Chemistry II	4
Psy 101 General Psychology	3	Free Electives*	11-14
Free Electives*	8-11	Health Profession Orientation	0
	15-18		15-18

Fifth Semester		Sixth Semester	
Phy 105 Introductory Physics **or**		Phy 106 Introductory Physics **or**	
Phy 201 General Physics I	4	Phy 202 General Physics II	4
Free Electives*	12-14	Free Electives*	12-14
	16-18		16-18

Seventh Semester		Eighth Semester	
Major Requirements and Electives*	15	Major Requirements and Electives*	15
	15		15

*Must include the core educational requirements.

Special Preprofessional Degree Program

Four years of undergraduate study ordinarily are required to qualify for the bachelor's degree. Wilkes University makes an exception in special circumstances to this requirement for doctoral students in dentistry, podiatric medicine, optometry and veterinary medicine.

These students may, with the approval of the Academic Standards Committee, satisfy the requirements for the bachelor's degree by completing three years of an academic major, at least the last two of which must be at Wilkes, and by requesting credit toward the degree for their first two years of work in professional school. Students in these programs must, however, satisfy the Core Requirements at Wilkes University to be considered for a bachelor's degree from the University.

Such students must also petition the Academic Standards Committee for permission to graduate, submit official transcripts from the professional school, and pay the usual graduation fees. In all cases the **final approval for the granting of the degree rests with the Academic Standards Committee of Wilkes University.**

Allied Health Programs

Temple University College of Allied Health Professions and Wilkes University have established affiliated programs to meet the need for increasing numbers of educated, highly skilled health care professionals. The programs are designed to prepare men and women in their respective fields to participate in comprehensive health care and develop necessary attitudes to become competent professionals.

Affiliated programs are offered in the following areas:

Health Records Administration
Occupational Therapy
Physical Therapy
Medical Technology

Successful completion of the selected programs, except physical therapy, at the College of Allied Health Professions will lead to the Bachelor of Science degree from Temple University.

The Allied Health Programs, except physical therapy, require four years of study. The first two years of study or the equivalent are done at Wilkes and the final two years at Temple University College of Allied Health Professions. Academic preparation at Wilkes University as well as admission requirements at Temple will differ somewhat for each program.

The prerequisite courses which are required for admission to Temple in each program are listed on the following page.

Course Requirements for All Students

Temple University Programs	Credits	Wilkes University Equivalents[1]
Humanities	6-8	Eng 101-102 English Composition
Social Science	3-4	Soc 101 Sociology
Psychology	3-4	Psy 232 Human Behavior

Additional Departmental Requirements

Health Records Administration

Social Science	3-4	Psy 221 Developmental Psychology
Science	8-9	Bio 121-122 General Biology
	6-8	Bio 115-116 Anatomy & Physiology (with lab)
		OR
	3-4	Bio 115 Comparative Anatomy & Physiology (with lab)
		AND
	3-4	Natural Science Elective (Chm, Physics, Adv. Biology)
Math	6-8	Mth 101-102 Fundamentals of Mathematics
		OR
	3-4	Mth 105 Analytical Geometry & Calculus
Humanities	6-8	Humanities Electives

Occupational Therapy

Science	8-9	Bio 115-116 Human Anatomy and Physiology
	4	Chm 115 Chemistry
Social Sciences	3-4	Psy 221 Developmental Psychology

Medical Technology

Science	8-9	Bio 121-122 General Biology
	8-9	Chm 115-116 General Chemistry
	8-9	Chm 231-232 Organic Chemistry
	6-8	Mth 101-102 Fundamentals of Mathematics
		OR
	3-4	Mth 105 Analytical Geometry & Calculus

[1]See various departmental sections of the Bulletin for course descriptions.

STUDENTS ARE STRONGLY URGED TO CONSULT THEIR ACADEMIC ADVISOR TO INSURE THAT THEY ENROLL IN THE APPROPRIATE COURSES.

MEDICAL TECHNOLOGY

Professor Lester Turoczi; Assistant Professor Pidcock.

Total minimum number of credits required for a major in Medical Technology leading to the B.S. degree — 128.

The National Accrediting Agency for Clinical Laboratory Science recommends certain requirements for a program of training leading to a B.S. degree. The curriculum offered at Wilkes University follows these recommendations and is presented below.

At the completion of three years, the student may be accepted by an affiliated program of medical technology for a period of twelve months' clinical training. Following graduation from the program, the student will receive the B.S. degree in medical technology from the University and will be eligible for certification as a medical technologist by the Board of Registry of Medical Technology or as a Clinical Laboratory Scientist by the National Certification Agency for Medical Laboratory Personnel.

Wilkes University has established a formal affiliation with the Allentown Hospital Association in Allentown, Pa., the Robert Packer Hospital in Sayre, Pa., the Scranton Medical Technology Consortium, Scranton, Pa., Somerset Medical Center, Somerville, N.J., and the Wilkes-Barre General Hospital in Wilkes-Barre, Pa. Fulfillment of the fourth year requirement at non-affiliated hospitals requires special permission of the department chairperson and of the Academic Standards Committee.

Recommended Course Sequence for a Major in Medical Technology

First Semester		Second Semester	
Bio 121 Principles of Modern Biology I	4	Bio 122 Principles of Modern Biology II	4
Chm 115 Elements and Compounds	4	Chm 116 The Chemical Reaction	4
Eng 101 Composition I	3	Eng 102 Composition II	3
Mth 105 or 111 Calculus I	4	Mth 106 or 112 Calculus II	4
CST 101 Core Studies I	1	PE 100 Activity	0
PE 100 Activity	0		
	16		15

Third Semester		Fourth Semester	
Bio 221 Cellular and Molecular Biology	4	Bio 222 Comparative Anatomy	4
Chm 231 Organic Chemistry I	4	Chm 232 Organic Chemistry II	4
Humanities Core Requirements	6	Humanities Core Requirements	6
Social Science Core Requirement	3	Social Science Core Requirement	3
	17		17

Fifth Semester		Sixth Semester	
Biology Elective	3	Bio 303 Bacteriology	3
Bio 397 Seminar*	1	Bio 341 Immunology and Immunochemistry	3
Chm 241 Inorganic Quantitative Analysis	4	Bio 397 Seminar*	1
Computer Science Elective	3	Mth 150 Elementary Statistics	3
Phy 105 Introductory Physics I	4	Phy 106 Introductory Physics II	4
Social Science or Humanities Core Requirement	3	Social Science or Humanities Core Requirement	3
	17-18		16-17

Seventh Semester	Eighth Semester

MEDICAL TECHNOLOGY PROFESSIONAL STUDY YEAR

The 30 credits supplied by the twelve months' clinical training are divided into the following courses:

Bio 371	Clinical Microbiology	7
Bio 372	Clinical Chemistry	8
Bio 373	Clinical Hematology/Coagulation	5
Bio 374	Clinical Immunohematology	4
Bio 375	Clinical Immunology/Serology	3
Bio 376	Clinical Seminar	3
		30

*Only one semester of Bio 397 is required but it must be taken in either the fifth or sixth semester.



PRE-PHARMACY PROGRAM

Dr. Ralph B. Rozelle, Dean of Health Sciences.

Wilkes University is affiliated by contract with the Temple University School of Pharmacy. The pharmacy program is a five-year program leading to a degree in pharmacy at Temple University. The first two years are offered at Wilkes and contain coursework listed below.

Two Years at Wilkes University

First Semester		Second Semester	
Bio 121 Principles of Modern Biology I	4	Bio 122 Principles of Modern Biology II	4
Chm 115 Elements and Compounds	4	Chm 115 The Chemical Reaction	4
Eng 101 Composition I	3	Eng 102 Composition II	3
Mth 105 Calculus for Life, Managerial, and Social Sciences I **or**		Mth 106 Calculus for Life, Managerial, and Social Sciences II **or**	
Mth 111 Calculus I	4	Mth 112 Calculus II	4
CST 101 Core Studies I	1	Free Electives	0-3
Free Electives	0-2		
	16-18		15-18

Third Semester		Fourth Semester	
Chm 231 Organic Chemistry I	4	Chm 232 Organic Chemistry II	4
Phy 105 Introductory Physics or		Phy 106 Introductory Physics or	
Phy 201 General Physics I	4	Phy 202 General Physics II	4
Ec 101 Principles of Economics I	3	Free Electives	8-10
Free Electives	5-7		
	16-18		16-18

Following completion of these two years successfully, students are eligible to be admitted to the final three years of pharmacy school at Temple University or to any other pharmacy school. All prerequisite courses listed above, e.g. Bio 121, Chm 115, etc., must be completed with a grade of at least 2.0.

PHYSICAL THERAPY

Dr. Ralph B. Rozelle, Dean of Health Sciences.

The affiliated physical therapy program requires three years of study at Wilkes University and three years at Temple University. Students who enter the professional three years of study at Temple will be granted the Bachelor of Arts degree in Psychology by Wilkes University following successful completion of their first year at Temple provided that they have met the University's Core Requirements. They will be granted the Master of Physical Therapy degree following successful completion of three years at Temple.

The undergraduate program at Wilkes is outlined below:

First Semester		Second Semester	
Psy 101 General Psychology	3	Psy Elective*	3
Bio 121 Principles of Modern Biology I	4	Bio 122 Principles of Modern Biology II	4
Chm 115 Elements and Compounds	4	Chm 116 The Chemical Reaction	4
Eng 101 Composition I	3	Eng 102 Composition II	3
CST 101 Core Studies I	1	PE 100 Activity	0
PE 100 Activity	0		
	15		14

Third Semester		Fourth Semester	
Psy 215 Research Design and Analysis	3	Psy Elective*	3
Core Requirements	9	Core Requirements	12
Mth 105 Calculus for Life, Managerial, and Social Sciences I	4	PE 100 Activity	0
PE 100 Activity	0		15
	16		

Fifth Semester		Sixth Semester	
Phy 105 Introductory Physics	4	Phy 106 Introductory Physics	4
Core Requirement	3	Core Requirement	3
Psy 211 Experimental Psychology	3	Psy 212 Experimental Psychology	3
Psy Electives*	6	Psy Electives*	6
	16		16

Required Psychology Electives*	Psychology 213	Physiological
	Psychology 214	Sensory and Perceptual Processes
	Psychology 221	Developmental
	Psychology 245	Clinical
	Psychology 398	Neuro
	Psychology 398	Internship

Transfer Credits from Temple University — 30.

Degree: B.A. in Psychology (Behavorial Medicine Track)

INDIVIDUALIZED STUDIES

This program is designed for those capable and motivated students who wish to undertake a course of study that cannot be provided for under any of the normal B.A., B.S. degree programs. The student will be responsible for generating a coherent proposal for a program of studies. This proposal must be selected by the student, approved by an advisor, and then by the Individualized Studies Committee. The program of studies may include courses offered by all departments at Wilkes University. In addition, credit may be assigned for appropriate off-campus study, work, and/or travel. Credits may be granted for knowledge or experience obtained prior to enrollment, with approval of the appropriate department and the Individualized Studies Committee.

Degree Requirements

The basic requirement for the degree in Individualized Studies is the accumulation of 121 credits. Although there are no specific course requirements, the spirit of the Wilkes University core curriculum is to be respected.



MATHEMATICS

Professor Merrill, Chairperson; Professors Emeritus Richards, Salsburg; Professors Koch, Sours, Tillman, Wong; Associate Professors Berard, DeCosmo; Visiting Associate Professor Kuhn; Assistant Professors Kugendran, Rosenbaum.

Total minimum number of credits required for a major in Mathematics leading to the B.A. degree — 127.

Total minimum number of credits required for a major in Mathematics leading to the B.S. degree — 129.

Total minimum number of credits required for a minor — 22 or 23.

Total minimum number of credits required for a minor in Statistics — 23.

Programs of study leading to the B.A. or B.S. degree with a **major or minor in mathematics or a minor in statistics** are offered by the Department of Mathematics and Computer Science. Also available are the M.S. degree in Mathematics and the M.S. degree in Education with a concentration in mathematics. Graduate programs and a combined five-year B.S.-M.S. degree in mathematics are described in a separate graduate bulletin.

The Department of Mathematics and Computer Science also offers B.A. and B.S. programs in computer science (see page 214), and a B.S. program in computer information systems (see page 211).

Major in Mathematics

The Department offers three tracks through which the baccalaureate degree major requirements in mathematics may be met: general mathematics (GM), applied mathematics (AM), and teacher certification (TC). The program in general mathematics provides preparation for graduate study and research in mathematics. The applied mathematics track is designed to provide a background for graduate study in applied mathematics or statistics, and for careers in industry or government service. The teacher certification track provides preparation for secondary school teaching. The GM and AM tracks, when combined with an appropriate second major or minor, will also provide an excellent foundation for graduation or professional study in business and management; economics; law; medicine; actuarial, computing, engineering, environmental and physical sciences. All three tracks share a common background in algebra, analysis, probability, and computer programming.

The B.A. degree is intended for those who wish to elect more humanities and social science courses, whereas the B.S. degree requires greater concentration in the natural and physical sciences. Both B.A. and B.S. programs are available in all three tracks. Required courses for a mathematics major are indicated in the curriculum outlines recommended on pages 264-266, which are based on an extensive prerequisite structure.

With the approval of the department, a student may earn credits in a maximum of five mathematics or computer science courses by passing special challenge examinations in them. Interested students may obtain further details and application forms from the department chairperson.

Minor in Mathematics

Required Courses:	**credit hours**
Mth 111-112; 202; 211 or 212; 214	19
Electives:	
Mth 311 or 314 or 331	3-4
Total	22-23

Minor in Statistics

In a wide range of sciences, both natural and social, statistical analysis is of major importance both in conducting research and in understanding its findings. Likewise, in governmental planning and industrial management, statistical methods are a necessary tool and constitute a major application of computing. The minor in statistics is intended to support work in a major either in another mathematical science or in a number of other disciplines.

Required Courses:	**credit hours**
Mth 105-106 or Mth 111-112; CS 123 or CS 125; Mth 351-352; and Mth 354	20
Electives:	
One of the following: Mth/CS 262; CS 321; or a Topics course in statistics	3
Total	23

Recommended Course Sequence for General and Applied Mathematics Tracks

NOTE: All core requirements should be chosen to satisfy the General Core Requirements listed on pages 57-60, except that science electives must be in accordance with the Department's requirements specified on page 267.

First Semester

	B.A.	B.S.
Mth 111 Calculus I	4	4
Eng 101 Composition I	3	3
CS 125 Computer Science I	3	3
Core Requirements	6	6
CST 101 Core Studies I	1	1
PE 100 Activity	0	0
	17	17

Second Semester

	B.A.	B.S.
Mth 112 Calculus II	4	4
Eng 102 Composition II	3	3
Core Requirements	6	6
Free Elective	3	3
PE 100 Activity	0	0
	16	16

Third Semester

	B.A.	B.S.
Mth 202 Set Theory and Logic	4	4
Mth 211 Intro. to Ordinary Differential Equations	4	4
Phy 201 (B.S.) or Science Elective[1]	3	4
Core Requirements	6	6
	17	18

Fourth Semester

	B.A.	B.S.
Mth 212 Multivariable Calculus	4	4
Mth 214 Linear Algebra	3	3
Science Elective[1]	3	4
Core Requirements	6	6
	16	17

Fifth Semester

	B.A.	B.S.
Mth 331[3] Intro. to Abstract Algebra I	4	4
Mth 351 Probability and Mathematical Statistics I	3	3
Science Elective[1]	3	3
Core Requirement	3	3
Free Elective	3	3
	16	16

Sixth Semester

	B.A.	B.S.
Mth/CS Elective[2]	3	6
Free Electives	12	9
	15	15

Seventh Semester

	B.A.	B.S.
Mth 311[3] Functions of a Real Variable	4	4
Mth/CS Elective[2]	3	3
Free Electives	9	9
	16	16

Eighth Semester

	B.A.	B.S.
Mth/CS Elective[2]	3	3
Free Electives	11	11
	14	14

[1] See page 267 for the Department's requirements regarding science electives.
[2] See page 267 for the Department's requirements regarding Mth/CS electives.
[3] Mth 311 and Mth 331 are offered in alternate years; one of them should be taken in the junior year, the other in the senior year.

Recommended Course Sequence for Teacher Certification Mathematics Track

NOTE: All core requirements should be chosen to satisfy the General Core Requirements listed on pages 57-60, except that science electives must be in accordance with the Department's requirements specified on page 267.

First Semester

	B.A.	B.S.
Mth 111 Calculus I	4	4
Eng 101 Composition I	3	3
CS 125 Computer Science I	3	3
Core Requirements	6	6
CST 101 Core Studies I	1	1
PE 100 Activity	0	0
	17	17

Second Semester

	B.A.	B.S.
Mth 112 Calculus II	4	4
Eng 102 Composition II	3	3
Psy 101 General Psychology	3	3
Core Requirement	3	3
Free Elective	3	3
PE 100 Activity	0	0
	16	16

Third Semester

	B.A.	B.S.
Mth 202 Set Theory and Logic	4	4
Ed 101 Practicum in Education	1	1
Ed 201 Intro. to Education	3	3
Phy 201 General Physics I	—	4
or Science Elective[1]	3	—
Core Requirements	6	6
	17	18

Fourth Semester

	B.A.	B.S.
Mth 212 Multivariable Calculus	4	4
Mth 214 Linear Algebra	3	3
Ed 202 Educational Psychology	3	3
Science Elective[1]	3	4
Core Requirement	3	3
	16	17

Fifth Semester

	B.A.	B.S.
Mth 331[3] Intro. to Abstract Algebra I	4	4
Mth 343 Intro. to Geometry*	3	3
Science Elective[1]	3	3
Core Requirement	3	3
	13	13

Sixth Semester

	B.A.	B.S.
Mth/CS Electives[2]	3	6
Ed 102 Practicum in Education	1	1
Core Requirement	3	3
Free Electives	9	6
	16	16

Seventh Semester

	B.A.	B.S.
Mth 203 The Teaching of Mathematics in Secondary Schools*	3	3
Mth 311[3] Functions of a Real Variable	4	4
Mth 351 Probability and Mathematical Statistics I	3	3
Mth/CS Elective[2]	—	3
Free Electives	4	1
	14	14

Eighth Semester

	B.A.	B.S.
Ed 371 The Individual in the Classroom	3	3
Ed 380 Professional Semester in Education	15	15
	18	18

1 See page 267 for the Department's requirements regarding science electives.
2 See page 267 for the Department's requirements regarding Mth/CS electives.
3 Mth 311 and Mth 331 are offered in alternate years; one of them should be taken in the junior year, the other in the senior year.
*Mth 203 and Mth 343 are offered in alternate years; one of them should be taken in the junior year, the other in the senior year.

Science Electives for Mathematics Majors:

B.A. candidates: Three courses in Biology, Chemistry, Earth and Environmental Sciences or Physics chosen from among those listed on page 59 under the "Scientific World" distribution area. Selections must include two different fields and one course with a laboratory component.

B.S. candidates: Physics 201 and a two-semester sequence in Biology, Chemistry, Earth and Environmental Sciences, or Physics

or

Physics 201-202 and at least three credits in Biology, Chemistry, Earth and Environmental Sciences, Physics, Philosophy 350 or Philosophy 352, EE 342 or any Engineering course not cross-listed in Computer Science. *(All eleven credits must be in courses numbered above 200 except that Bio 121, 122, Chm 115, 116, or 118 are also acceptable in this requirement.)*

Mathematics/Computer Science Electives for Mathematics Majors:

General Mathematics Track:
One of the following courses: Mth 342, 413, or 432; and
One of the following courses: Mth 262, 314, 352, 361, 362, or 364; and
for B.A. candidates: Any one Mth or CS course numbered above 200.*
B.S. candidates: Any two Mth or CS courses numbered above 200.*

Applied Mathematics Track:
Two of the following courses: Mth 262, 314, 352, 361, 362, or 364; and
for B.A. candidates: Any one Mth or CS course numbered above 200.*
B.S. candidates: Any two Mth or CS courses numbered above 200.*

Teacher Certification Mathematics Track:
One of the following courses: Mth 262, 314, 352, 361, 362, or 364; and
for B.S. candidates: Any two Mth or CS courses numbered above 200.

*Mth 203, 232, and 243 are **not** acceptable in this requirement.

Summary of Minimum Credit Distribution:

General and Applied Mathematics Tracks	B.A.	B.S.
Mth 111, 112, 202, 211, 212, 214, 311, 331, and 351	34	34
Mth/CS Electives	9	12
CS 125	3	3
Phy 201	—	4
Science Electives	9	7
Eng 101-102	6	6
Core Requirements	28	28
Free Electives	38	35
Total	127	129

Teacher Certification Mathematics Track	B.A.	B.S.
Mth 111, 112, 202, 203, 212, 214, 311, 331, 343, and 351	36	36
Mth/CS Electives	3	9
CS 125	3	3
Phy 201	—	4
Science Electives	9	7
Eng 101-102	6	6
Ed 101, 102, 201, 202, 371, and 380	26	26
Proficiency Examination	—	—
Psy 101	3	3
Core Requirements	25	25
Free Electives	16	10
Total	127	129

MTH 84. COLLEGE PREPARATORY MATHEMATICS — **Four hours/week**

This course provides the basic mathematics skills for students majoring in fields other than science or engineering. It may also be taken by those who need it to prepare themselves for Mth 100, 101 or 103. Topics covered include: review of arithmetic, introductory algebra, and quantitative reasoning. Credits in this course will not be counted in the graduation requirement in any degree program at Wilkes. Only P (passed) or F (failed) grades are given.

Offered every fall and summer.

MTH 100. PRE-CALCULUS MATHEMATICS — **Four credits**

A remedial course in advanced algebra and trigonometry designed to prepare students for calculus. Content of this course should normally be studied in secondary school. Mathematics and computer science majors will not receive credit in their major for Mth 100.

Prerequisite: Two years of secondary school mathematics in algebra and geometry.

Offered every fall, spring, and summer.

MTH 101. FUNDAMENTALS OF MATHEMATICS I — **Three credits**

Basic quantitative and analytic techniques and concepts designed to help the student understand science, technology, and human institutions as they bear on the individual citizen. Topics include: graphical presentation of data, exponential growth and decay, probability and statistics, mathematics of finance, consumer mathematics, vectors and matrices, and linear programming. Not open to students with credits in Mth 103, 104, or any course in calculus.

Offered every fall and summer.

MTH 102. FUNDAMENTALS OF MATHEMATICS II — **Three credits**

A continuation of Mth 101. Not open to students with credits in Mth 103, 104, or any course in calculus.

Prerequisite: Mth 101.

Offered every spring and summer.

MTH 103. MATHEMATICS FOR ELEMENTARY SCHOOL TEACHERS I — **Three credits**

A study of the theory of arithmetic, structure of the number systems, and other topics relevant to the teaching of mathematics in elementary schools. Not open to students with credits in Mth 101, 102, or any course in calculus.

Offered in the fall semester of odd years and every summer.

MTH 104. MATHEMATICS FOR ELEMENTARY SCHOOL TEACHERS II — **Three credits**

A continuation of Mth 103. Not open to students with credits in Mth 101, 102, or any course in calculus.

Prerequisite: Mth 103.

Offered in the spring semester of even years and every summer.

MTH 105. CALCULUS FOR LIFE, MANAGERIAL, AND SOCIAL SCIENCES I — **Four credits**

Intended primarily for students of social and natural sciences. Topics include: review of algebra, limit, differentiation, integration, sequences and series, partial differentiation, differential equations, and probability. Not open to students with credits in Mth 111 or 112.

Prerequisites: Geometry, Algebra II, and some knowledge of Trigonometry.

Offered every fall and summer.

MTH 106. CALCULUS FOR LIFE, MANAGERIAL, AND SOCIAL SCIENCES II — **Four credits**

A continuation of Mth 105. Not open to students with credits in Mth 111 or 112.

Prerequisite: Mth 105.

Offered every spring and summer.

MTH 111. CALCULUS I — **Four credits**

Calculus of functions of one variable. Topics include: functions, limits and continuity, differentiation, integration and their applications, infinite sequences and series. Not open to students with credits in Mth 105 or 106.

Prerequisites: Mth 100 or at least three years of secondary school mathematics including Geometry, Algebra II, and topics in Trigonometry.

Offered every fall, spring, and summer.

MTH 112. CALCULUS II — **Four credits**

A continuation of Mth 111. Not open to students with credit in Mth 106.

Offered every fall, spring, and summer.

MTH 150. ELEMENTARY STATISTICS — **Three credits**

Elementary statistical inference, with an emphasis on ideas, techniques, and applications in the life, physical, and social sciences. Topics include descriptive statistics, confidence intervals, hypothesis testing, contingency tables, multiple regression, and analysis of variance. Not open to mathematics majors or students with credit in Mth 351.

Prerequisite: Two years of high school algebra.

Offered every fall, spring, and summer.

MTH 202. SET THEORY AND LOGIC — **Four credits**

Designed to provide the logical and set theoretical prerequisites for the upper-level courses in analysis, algebra, computer science, and topology. Topics include: informal logic and propositional calculus, sets, relations, functions, axiom of choice and its equivalents, cardinal and ordinal numbers. Three hours lecture and one hour problem-discussion per week.

Prerequisite: Mth 112 or consent of instructor.

Offered every fall.

MTH 203. THE TEACHING OF MATHEMATICS IN SECONDARY SCHOOLS — **Three credits**

This course deals with topics and perspectives that are relevant to the teaching of mathematics in secondary schools (7-12). Topics include: history of modern algebra and geometry as deductive, axiomatic systems; recommendations of and material published by the various organizations (CUPM, SMSG, UICSM, etc.) concerned with the improvement of school mathematics curricula; local and national professional organizations, evaluation of instruction. (same as Ed 203G)

Prerequisite: Junior standing in mathematics.

Offered in the fall semester of odd years.

MTH 211. INTRODUCTION TO ORDINARY DIFFERENTIAL EQUATIONS **Four credits**

First-order and linear higher-order differential equations; matrices, determinants, and systems of differential equations; numerical methods of solution; the Laplace transform.

Prerequisite: Mth 112.

Offered every fall and summer.

MTH 212. MULTIVARIABLE CALCULUS **Four credits**

Differential and integral calculus of real and vector valued functions. Topics include continuity, partial differentiation, implicit functions, Taylor's Theorem, gradient, curl, line, surface and multiple integrals, inverse functions, theorems of Green and Stokes.

Prerequisite: Mth 112.

Offered every spring and summer.

MTH 214. LINEAR ALGEBRA **Three credits**

An axiomatic approach to vector spaces, linear transformations, systems of linear equations, eigenvalues and eigenvectors.

Prerequisite: Mth 112 or consent of instructor.

Offered every spring.

MTH 232. ABSTRACT ALGEBRA FOR ELEMENTARY SCHOOL TEACHERS **Three credits**

A study of basic concepts of abstract algebra for elementary school teachers. Not open to mathematics or computer science majors or those with credit in Mth 331.

Prerequisite: Mth 104 or consent of instructor.

Offered in the fall semester of even years and every summer.

MTH 243. GEOMETRY FOR ELEMENTARY SCHOOL TEACHERS **Three credits**

A study of topics in informal geometry and measurements for elementary school teachers. Not open to mathematics or computer science majors or those with credit in Mth 343.

Prerequisite: Mth 104 or consent of instructor.

Offered in the spring semester of odd years and every summer.

MTH 260. LINEAR PROGRAMMING **Three credits**

Graphical linear programming, simplex algorithm and sensitivity analysis. Special L.P. models such as the transportation problem, transshipment problem, and assignment problem. May include integer programming, branch and bound algorithm, geometric programming, goal programming. (same as CS 260)

Prerequisites: Mth 106, CS 123 or CS 125.

Offered in the fall semester of odd years.

MTH 262. OPERATIONS RESEARCH **Three credits**

A survey of operations research topics such as decision analysis, inventory models, queueing models, dynamic programming, network models, heuristic models, and non-linear programming. (same as CS 262)

Prerequisites: CS 123 or CS 125; Mth 105-106 or Mth 111-112; and some elementary knowledge of matrices.

Offered every spring.

MTH 311. FUNCTIONS OF A REAL VARIABLE **Four credits**

A rigorous study of the topology of the real line, limits, continuity, differentiation, integration, and series of functions.

Prerequisite: Mth 202 or consent of instructor.

Offered in the fall semester of odd years.

MTH 314. FUNCTIONS OF A COMPLEX VARIABLE **Three credits**

Complex functions, limit, continuity, analytic functions, power series, contour integration, Laurent expansion, singularities and residues.

Prerequisite: Mth 212 or consent of instructor.

Offered in the fall semester of even years.

MTH 331. INTRODUCTION TO ABSTRACT ALGEBRA I **Four credits**

A rigorous study of elementary number theory, groups, rings, and fields.

Prerequisite: Mth 202 or consent of instructor.

Offered in the fall semester of even years.

MTH 342. INTRODUCTION TO TOPOLOGY **Three credits**

Metric spaces, topological spaces, countability and separation axioms, compactness, connectedness, product spaces.

Prerequisite: Mth 311 or consent of instructor.

Offered in the spring semester of even years.

MTH 343. INTRODUCTION TO GEOMETRY **Three credits**

A study of selected topics from Euclidean geometry, affine geometry, projective geometry, and convexity.

Prerequisite: A year of calculus or consent of instructor.

Offered in the fall semester of even years.

MTH 351. PROBABILITY AND MATHEMATICAL STATISTICS I **Three credits**

Random variables, probability distributions, expectation and limit theorems, confidence intervals.

Prerequisite: Mth 106 or 112 or consent of instructor.

Offered every fall.

MTH 352. PROBABILITY AND MATHEMATICAL STATISTICS II **Three credits**

Hypothesis testing, non-parametric methods, multivariate distributions, introduction to linear models.

Prerequisite: Mth 351 or consent of instructor.

Offered in the spring semester of odd years.

MTH 354. STATISTICAL METHODOLOGY **Three credits**

This course emphasizes applications, using statistical computer packages (SPSS or BMDP) and real data sets from a variety of fields. Topics include estimation and testing; stepwise regression; analysis of variance and covariance; design of experiments; contingency tables; and multivariate techniques, including the log-linear model.

Prerequisite: Mth 150 or Mth 351 or consent of instructor.

Offered in the spring semester of even years.

MTH 361. INTRODUCTION TO APPLIED MATHEMATICS I **Three credits**

Intended for physical science and engineering students. Topics to be selected from: vector, integral, and differential calculus; power series; differential equations; Fourier series; matrices; determinants; and eigenvalue problems.

Prerequisite: Mth 212.

Offered every fall.

MTH 362. INTRODUCTION TO APPLIED MATHEMATICS II — **Three credits**

A continuation of Mth 361.

Prerequisite: Mth 361 or consent of instructor.

Offered every spring.

MTH 364. NUMERICAL ANALYSIS — **Three credits**

Numerical methods of differentiation, integration, solution of equations and of differential equations with emphasis on problems that lend themselves to solution using computers (same as CS 364).

Prerequisites: Mth 211 and CS 123 or CS 125 or consent of instructor.

Offered in the spring semester of odd years.

MTH 395-396. INDEPENDENT STUDY IN MATHEMATICS — **Variable credit**

Individual study in a chosen area of mathematics under the supervision of a faculty member. May be repeated for credit.

Prerequisite: Approval of department chairperson.

MTH 397. SEMINAR — **One to three credits**

Presentations and discussions of selected topics.

Prerequisite: Approval of department chairperson.

MTH 399. COOPERATIVE EDUCATION — **Three or six credits**

Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)

Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

MTH 413. FUNCTIONS OF SEVERAL VARIABLES — **Three credits**

A modern treatment of calculus of functions of several real variables. Topics include: Euclidean spaces, differentiation, integration on manifolds leading to the classical theorems of Green and Stokes.

Prerequisites: Mth 214 and 311.

Offered when demand warrants.

MTH 432. INTRODUCTION TO ABSTRACT ALGEBRA II — **Three credits**

A continuation of Mth 331. Polynomial rings, ideals, field extensions, and Galois Theory.

Prerequisite: Mth 331.

Offered when demand warrants.

MTH 470. READING COURSE — **One to three credits**

Advanced study of special topics under the supervision of a faculty member. Designed for students who have completed a substantial amount of course work in mathematics. May be repeated for credit.

Prerequisites: Senior standing and approval of department chairperson.

MTH 198/298/398/498. TOPICS IN MATHEMATICS — **Variable credits**

A study of topics of special interest. It may be a continuation and intensive study of topics begun in the upper-level courses in analysis, topology, algebra, and probability. May be repeated for credit.

Prerequisite: Varies with topics studied.

Additional 500-level graduate courses in mathematics are open to qualified mathematics majors. See the graduate bulletin for complete listing.

MILITARY SCIENCE (Army ROTC)

Lieutenant Colonel Casey, Chairperson.

The primary objective of the ROTC program is to develop leadership capabilities and to train future officers for both the active and reserve components of the United States Army.

Military Science instruction for Wilkes University students is offered on campus at King's College or the University of Scranton pursuant to an agreement with the Military Science Department at the University of Scranton. A two-year and four-year program are offered, both of which lead to a commission as an officer in the United States Army. To obtain this commission, qualified male and female students must successfully pass an aptitude test, a physical examination, and complete either the two- or four-year program of approved Military Science courses. While enrolled in the Advanced Courses (Military Science III and IV), the student will receive $100 per month subsistence allowance. Uniforms, equipment, and textbooks required for Army ROTC classes will be supplied by the Army. Students may compete for Army ROTC scholarships while in high school (4-year awards), or during college (3- and 2-year awards). Scholarships pay tuition (80% or $7,000 per year, whichever is more), textbooks, lab and other academic fees, plus an allowance of up to $1,000 each school year.

Students qualify for advanced ROTC courses (2-year program) in three ways:

(1) **On Campus Courses** — most students take introductory military science courses on campus during their freshman and sophomore years. These courses allow them to learn about the Army and the opportunities and responsibilities of an officer without incurring an obligation. This "basic" program generally involves one course per school term, although students may arrange to compress more than one of the required courses into a single term.

(2) **Summer Programs** — students may also qualify through a paid, six-week, no obligation summer "Basic Camp" which provides intensive military training at Fort Knox, Kentucky. Students may also compress all freshmen and sophomore military science courses during one on-campus summer session.

(3) **Advanced Placement** — students with prior military service, members of the United States Army Reserve or National Guard, or JROTC members may qualify for advanced placement into the advanced Army ROTC courses.

Two-Year Program

Available to qualified students having a minimum of two academic years remaining to degree completion, and meeting criteria set forth in paragraphs

(2) or (3) above. Application for this program must be made prior to the end of the Spring Semester of the sophomore year for those not enrolled in previous Military Science instruction. Also available for accepted graduate students.

Four-Year Program

Consists of all eight Military Science courses (commencing no later than the sophomore year). Enrollment in the first four courses of Military Science (MS I & II) is accomplished in the same manner as any other college course and carries no military obligation. Application to enroll in the Advanced Military Science courses (MS III & IV) must be made while enrolled in Military Science 22.

While enrolled in the Advanced Course, each student is required to successfully complete a six-week paid Advanced Camp at Fort Bragg, North Carolina, normally after completing Military Science 102. Transportation, food, lodging, and medical and dental care, are provided by the Army.

Military Science Courses

MS 11-12. MILITARY SCIENCE I — **Two credits**

Military history designed to provide a fundamental understanding of the Army's organization, structure, and components, and to analyze major events and influences of Army History. Examination of the formulation and implementation of national security policy will be made. The student will also gain an acquaintance with the evolution of warfare, military theory, and the military profession, with particular emphasis on leadership. One hour for two semesters.

MS 21-22. MILITARY SCIENCE II — **Four credits**

Introduction to land navigation, including use of the compass and topographic maps. First aid, to include CPR (Certification available dependent upon student interest). A survey of leadership theory to include leadership models and group dynamics is held. Two hours for two semesters.

MS 101. MILITARY SCIENCE III — **Two credits**

Military skills and professional knowledge subjects designed to instruct the cadet in the principles and techniques of applied leadership, advanced land navigation, and tactics. An introduction to the international agreements governing armed forces, operational planning, and the functions of command and staff is given. Two hours.

Prerequisite: MS 21-22, or equivalent.

MS 102. MILITARY SCIENCE III — **One credit**

Instruction designed to prepare the student for the ROTC Advanced Camp. Emphasis on applied small unit leadership, physical conditioning, practical training on military equipment, tactics and unit drill. Two hours.

MS 121. MILITARY SCIENCE IV — **Two credits**

An examination of mid-level management considerations in the Army. The course addresses the Army's personnel, training and logistics management system. In addition, the cadet is given an overview of the American Military Justice system, the Law of War, and both legal and practical considerations in connection with apprehension and search of personnel, seizure of contraband, and individual rights. Two hours.

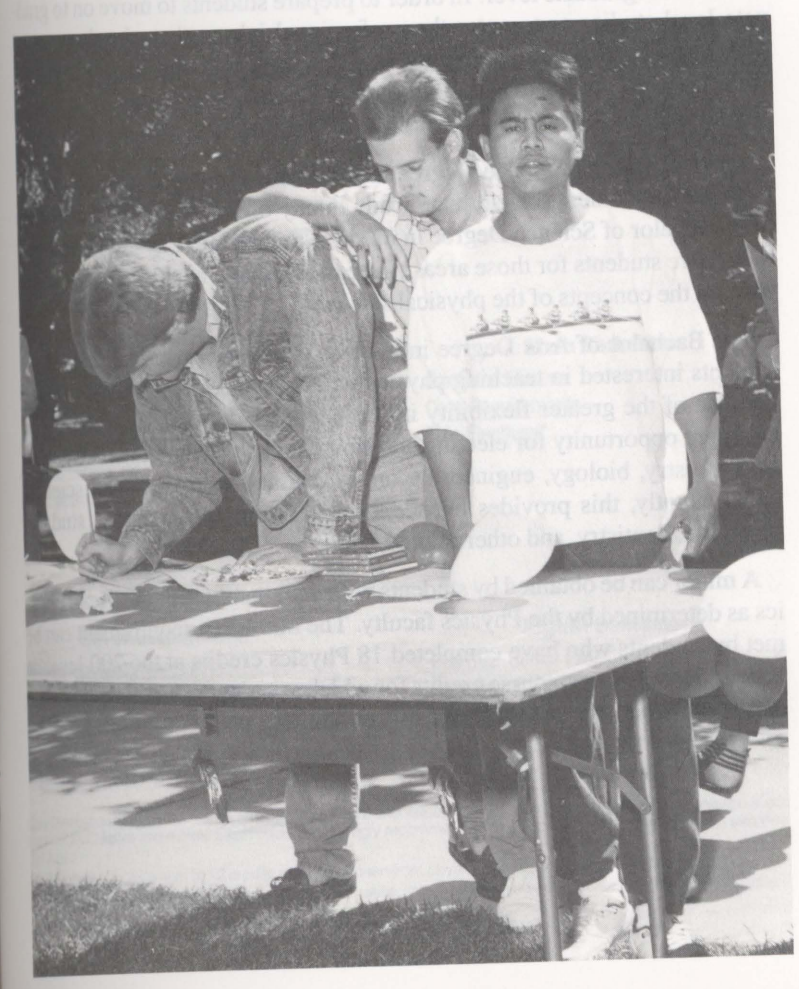
MS 122. MILITARY SCIENCE IV — **One credit**

The Army Officer in Contemporary American Society. An introduction to professionalism and military ethics. Provides the cadet with an introduction to the profession, its characteristics, roles and responsibilities; a basic understanding of the professional soldier's responsibilities to the nation and the armed forces; an understanding of the needs for ethical conduct, sensitivity to ethical issues, and improved ethical decision-making skills. Additionally, the course offers outside presentations in the banking and insurance fields. Moreover, a review of logistics, counseling, and written and oral communication is given. Two hours.

MS 130. MILITARY SCIENCE LAB — **No credit**

Required of all Military Science students each semester. Stresses practical application of classroom theory and Army related subjects such as leadership, drill and ceremonies, weapons training, land navigation, first aid, mountaineering, and tactics. Two hours.

NOTE: Students desiring to pursue Military Science studies through to a commission are also required to complete additional courses in the Humanities and Computer Science. See the Professor of Military Science for more information.



PHYSICS

Associate Professor Maxwell, Chairperson; Professor Bellas, *Amicus Scholae;* Professor Emeritus Donahoe; Professors Hostler, Orehotsky, Placek; Associate Professor Emeritus Bailey; Associate Professor Maxwell; Assistant Professors Kucirka, Loncoski.

Total minimum number of credits required for a major in Physics leading to the B.A. degree — 127.

Total minimum number of credits required for a major in Physics leading to the B.S. degree — 129.

Total minimum number of credits required for a major in Medical & Health Physics leading to the B.S. degree — 131.

Total minimum number of credits required for a minor — 18.

The Department of Physics takes seriously the responsibility of teaching on the undergraduate level. In order to prepare students to move on to graduate level studies or to enter the professional job market, the department offers three distinct curriculum tracks. These include the Bachelor of Science Degree in Physics, the Bachelor of Science Degree in Medical and Health Physics, and the Bachelor of Arts Degree in Physics.

The Bachelor of Science Degree in Physics is a modern program which prepares the student for graduate study in any of the scientific disciplines. The Bachelor of Science Degree in Medical and Health Physics is designed to prepare students for those areas of the medical and health sciences which employ the concepts of the physical sciences.

The Bachelor of Arts Degree in Physics is primarily designed for those students interested in teaching physics on the high school level. However, because of the greater flexibility in the Bachelor of Arts Program it is an excellent opportunity for electing additional courses from other fields such as chemistry, biology, engineering, and earth and environmental science. Consequently, this provides excellent background for advanced study in medicine, dentistry, and other related fields.

A minor can be obtained by students with demonstrated expertise in Physics as determined by the Physics faculty. The minimum requirement can be met by students who have completed 18 Physics credits at the 200-level or above, but only those course credits for which a student has achieved a grade of 2.0 or higher will count toward this minimum.

Recommended Course Sequence for a B.A. Degree in Physics

First Semester	
Eng 101 Composition I	3
Mth 111 Calculus I	4
or 105 Intro. to Calculus I	
Phy 121 Technological Survival	3
CST 101 Core Studies I	1
Core Requirement	3
Free Elective*	3
PE 100 Activity	0
	17

Second Semester	
Eng 102 Composition II	3
Mth 112 Calculus II	4
or 106 Intro. to Calculus II	
Computer Science Elective	3
Core Requirement	3
Free Elective*	3
PE 100 Activity	0
	16

Third Semester	
Chm 115 Elements & Compounds	4
Mth 211 Differential Equations	4
or Science Elective	
Phy 201 General Physics I	4
or 105 Introductory Physics I	
Core Requirement	3
	15

Fourth Semester	
Chm 116 Chemical Reaction	4
Mth 212 Multivariable Calculus	4
or Science Elective	
Phy 202 General Physics II	4
or 106 Introductory Physics II	
Core Requirement	3
	15

Fifth Semester	
Phy 203 General Physics III	3
or Science Elective	
Phy 221 Elect. Instruments	3
Core Requirements	6
Free Electives*	4-6
	16-18

Sixth Semester	
Statistics Elective	3
Core Requirements	6
Free Electives*	6-8
	15-17

Seventh Semester	
Phy 391 Senior Projects I	1
Free Electives*	15
	16

Eighth Semester	
Phy 392 Senior Projects II	2
Core Requirement	3
Free Electives*	12
	17

Core Distribution Requirement — 15 credits from Culture and Value, 9 credits from Society and Human Behavior, and 3 credits from Creative and Artistic Expression. It is strongly recommended that Soc 391 & 392 be taken along with Phy 391 & 392.

Free Electives — A minimum of 12 credits must be chosen from physics courses numbered 200 or above.

Science Electives — May be chosen from any mathematics, science, or engineering courses numbered 200 above.

Recommended Course Sequence for a B.S. Degree in Physics

First Semester		Second Semester	
Eng 101 Composition I	3	Eng 102 Composition II	3
Mth 111 Calculus I	4	Mth 112 Calculus II	4
Phy 121 Technological Survival	3	Phy 202 General Physics II	4
Phy 201 General Physics I	4	Computer Science Elective	3
CST 101 Core Studies I	1	Core Requirement	3
PE 100 Activity	0	PE 100 Activity	0
	15		17
Third Semester		**Fourth Semester**	
Chm 115 Elements & Compounds	4	Chm 116 Chemical Reaction	4
Mth 211 Differential Equations	4	Mth 212 Multivariable Calculus	4
Phy 221 Elect. Instrumentation	3	Phy 336 Optics	3
Core Requirement	3	Phy 340 Thermodynamics	3
Free Elective	3	or 310 Mechanics	
	17	Core Requirement	3
			17
Fifth Semester		**Sixth Semester**	
Phy 203 General Physics III	3	Phy 302 Math. in Phys. & Sciences	3
Phy 301 Math. in Phys. & Sciences	3	Phy 310 Mechanics	3
Phy 331 E & M I	3	or 340 Thermodynamics	
Phy 333 E & M Lab I	1	Phy 332 E & M II	3
Core Requirements	6	Phy 334 E & M Lab II	1
	17	Phy 380 Nuclear Physics	3
		or 361 Atomic Physics	
		Core Requirement	3
			16
Seventh Semester		**Eighth Semester**	
Phy 351 Quantum Mechanics	3	Phy 361 Atomic Physics	3
Phy 391 Senior Projects I	1	or 380 Nuclear Physics	
Phy 393 Advanced Physics Lab I	2	Phy 392 Senior Projects II	2
Core Requirement	3	Phy 394 Advanced Physics Lab II	2
Free Elective	3	Core Requirements	6
Science Electives	3-6	Science Elective	3
	15-18		16

Core Distribution Requirement — 15 credits from Culture and Value, 9 credits from Society and Human Behavior, and 3 credits from Creative and Artistic Expression. It is strongly recommended that Soc 391 & 392 be taken along with Phy 391 & 392.

Science Electives — May be chosen from any mathematics, science, or engineering courses numbered 200 or above. Students contemplating graduate studies should choose 6 of the credits in advanced mathematics.

Recommended Course Sequence for a B.S. Degree in Medical and Health Physics

First Semester		Second Semester	
Eng 101 Composition I	3	Eng 102 Composition II	3
Mth 111 Calculus I	4	Mth 112 Calculus II	4
Phy 121 Technological Survival	3	Phy 202 General Physics II	4
Phy 201 General Physics I	4	Computer Science Elective	3
CST 101 Core Studies I	1	Core Requirement	3
PE 100 Activity	0	PE 100 Activity	0
	15		17
Third Semester		**Fourth Semester**	
Chm 115 Elements & Compounds	4	Chm 116 Chemical Reaction	4
Mth 211 Differential Equations	4	Egr 250 Biomedical Engineering	3
Phy 221 Elect. Instrumentation	3	Phy 336 Optics	3
Phy 203 General Physics III	3	Core Requirement	3
Core Requirement	3	Free Elective	3
	17		16
Fifth Semester		**Sixth Semester**	
Bio 115 Human Anat. & Phys. I	4	Bio 116 Human Anat. & Phys. II	4
Chm 231 Organic Chemistry I	4	Chm 232 Organic Chemistry II	4
Phy 323 X-Ray Diffraction	4	Core Requirement	3
or Science Elective		Free Elective	6
Core Requirements	6		17
	18		
Seventh Semester		**Eighth Semester**	
Phy 323 X-Ray Diffraction	3	Phy 326 Med. & Health Phys. II	3
or Science Elective		Phy 390 Practicum	3
Phy 325 Med. & Health Phys. I	3	Phy 392 Senior Projects II	2
Phy 390 Practicum	3	Phy 394 Advanced Physics Lab II	2
Phy 391 Senior Projects I	1	Core Requirements	6
Phy 393 Advanced Physics Lab I	2		16
Core Requirement	3		
	15		

Core Distribution Requirement — 15 credits from Culture and Value, 9 credits from Society and Human Behavior, and 3 credits from Creative and Artistic Expression. It is strongly recommended that Soc 391 & 392 be taken along with Phy 391 & 392.

Science Electives — May be chosen from any science or engineering courses numbered 200 or above.

Practicum — May be taken during the previous summer.

PHY 101. GALAXIES TO ATOMS **Three credits**

Traces the historical and philosophical development of the fundamental concepts of physics and the physical sciences. It begins with the ancient Greek view of the cosmos and how these ideas evolved into the mechanical view of the universe made famous by scientists like Galileo and Newton. The course also considers the concepts of modern atomic and nuclear physics and relativity and how these ideas have evolved into our present view of the physical world. Class meets three hours per week: two hours of lecture and one hour of laboratory. Fee: $5.

Prerequisite: No previous background in science or college-level mathematics is required.

PHY 102. THE FIFTH DIMENSION OF PHYSICS: SOCIETY **Three credits**

Considers the great discoveries of physics and its applications to technology from Newton to Einstein and how these discoveries interface with broader social issues. Science and technology have been looked upon as the cause of many of our present problems such as air pollution and nuclear waste; simultaneously, society looks to science and technology for the solution to these problems. The course will consider these interactions as they relate to present problems of society. Class meets three hours a week: two hours of lecture and one hour of laboratory/discussion. Fee: $5.

Prerequisite: No previous background in science or college-level mathematics is required.

PHY 105-106. INTRODUCTORY PHYSICS **Four credits each**

An introductory course designed to promote an understanding of the more important fundamental laws & methods of the major areas of physics. Laboratory work to emphasize basic principles and to acquaint the student with measuring instruments and their use, as well as the interpretation of experimental data. First semester: mechanics, properties of matter, heat, and thermodynamics. Second semester: sound, light and optics, electricity and magnetism, modern concepts. Demonstration-lecture two hours a week, recitation one hour a week, and one laboratory three hours a week. Fee: $40 per semester.

PHY 121. TECHNOLOGICAL SURVIVAL **Three credits**

An introduction to the techniques of analysis and problem solving in engineering and the sciences. Also a presentation and discussion of scientific and technical world views. Emphasis on visualization with symbolic, verbal, and written communication. Introduction to selected mathematical topics including vectors and matrices. Modeling, examples of physical law, engineering design, and problem solving using computers. Selected current topics with technical merit or likely impact on the future, and a cooperative design project. Three hours lecture/recitation per week.

Prerequisite: Familiarity with Algebra and Geometry.

PHY 201. GENERAL PHYSICS I **Four credits**

A thorough grounding in the concepts, principles, and laws of mechanics, thermodynamics, and wave motion. Instruction by demonstration-lecture, recitation, problem solving, and experimental work. Demonstration-lecture two hours a week, recitation one hour a week, and laboratory three hours a week. Fee: $40.

Corequisite: Mth 111.

PHY 202. GENERAL PHYSICS II **Four credits**

Electricity and magnetism, optics and light. Demonstration-lecture two hours a week, recitation one hour a week, and laboratory three hours a week. Fee: $40.

Prerequisite: Phy 105 or 201.

Corequisite: Mth 112.

PHY 203. GENERAL PHYSICS III **Three credits**

Modern physics including the experimental basis, concepts, and principles of atomic and nuclear physics. Demonstration-lecture three hours a week.

Prerequisite: Phy 202.

PHY 210. INTRODUCTION TO MATERIALS SCIENCE AND ENGINEERING **Three credits**

Application of materials properties to engineering design. Introduction to atomic arrangements, crystal structures, imperfection, phase diagrams, and structure-property relations. Fundamentals of iron, steel, and non-ferrous materials. The behavior of materials in environmental conditions. Three hours lecture a week. (same as MaE 210)

Prerequisites: Phy 201, 202.

PHY 211. STATICS & DYNAMICS **Three credits**

This course develops the principles of Newtonian mechanics with applications to the equilibrium of rigid structures as well as to the stable motions of mechanisms. Topics include velocities and accelerations in orthogonal coordinate systems; internal and external forces; inertia forces and the effective potential energy; centroids and moments of inertia; kinetics and kinematics of particles and rigid bodies. (same as ME 231)

Prerequisites: Phy 105 or 201, Mth 112.

PHY 213. FLUID MECHANICS **Three credits**

Thermodynamics and dynamic principles applied to fluid behavior, ideal, viscous, and compressible fluids under internal and external flow conditions. (same as ME 233)

Prerequisite: Phy 211/ME 231.

PHY 221. ELECTRONIC INSTRUMENTATION **Three credits**

An introduction to the nature and use of standard and specialized electronic instruments. The study of analog and digital circuits with emphasis on the useful functions which can be performed. A two-hour class and one three-hour laboratory a week. Fee: $35.

Prerequisite: Phy 106 or 202 or junior standing in the sciences.

PHY 225. SYNOPTIC METEOROLOGY **Four credits**

Topics include surface and upper-air weather systems, weather phenomena, climate, and local weather influences. Synoptic map analysis and interpretation are emphasized. Three hours lecture and three hours laboratory. Fee: $40. (same as EES 251)

PHY 228. PRINCIPLES OF ASTRONOMY **Four credits**

Topics include orbital mechanics, results of planetary probes, spectra and stellar evolution, and cosmology. Three hours lecture and three hours laboratory. Fee: $40. (same as EES 280)

PHY 301-302. MATHEMATICAL METHODS IN PHYSICS AND THE SCIENCES **Three credits each**

Study of different areas of mathematics and their applications in physics, engineering, and the sciences. Topics include: ordinary and partial differential equations, Fourier methods, complex variables, matrix methods, Green's functions, tensor analysis, group theoretical methods, and others. Three hours lecture-discussion a week.

Prerequisites: Mth 211, 212.

PHY 310. ANALYTICAL MECHANICS **Three credits**

An intermediate level course designed to develop an understanding of the principles of mechanics based on the Newtonian as well as the Lagrangian and Hamilton formulations. The application of matrices, tensors, and differential equations and advanced techniques to the solution of mechanics problems. Topics include harmonic oscillations, central force problems, rigid body motions, inertia and stress tensors, elastic waves, eigenvalue problems, normal coordinates and finite symmetry groups. Recitation-lecture three hours a week.

Prerequisites: Mth 211, 212, Phy 211.

PHY 323. X-RAY DIFFRACTION **Four credits**

Study of structure and composition of solids using X-rays. Effects of annealing, substructures, cold work, preferred orientation, and ordering. Principles of design and applications of X-ray

diffraction techniques. Three hours lecture and one three-hour laboratory a week. Fee: $45. (same as MaE 311)

Prerequisite: Phy 203.

PHY 325-326. MEDICAL & HEALTH PHYSICS I & II **Three credits each**

A study of the applications of basic physical principles to various problems in the medical and health sciences. These include the effect of ionizing and non-ionizing radiation on living matter and the various techniques of scanning and image formation. Also included will be the topics of dosimetry, lasers in medicine, computer amsted diagnoses and other areas of interest to medical and health physicists. Fee: $40 per semester.

Prerequisite: Junior standing in the program or approval of instructor.

PHY 330. OPTICS AND LIGHT **Four credits**

The principles of geometrical and physical optics are considered in considerably greater detail than in the introductory course. Image formation, refraction, diffraction, origin of spectra, polarized light, optical activity, etc. Three hours class and one three-hour laboratory a week. Fee: $40.

Prerequisite: Phy 202.

PHY 331. ELECTRICITY & MAGNETISM I **Three credits**

Vector analysis. The concept of fields. Dielectric and magnetic media; fields in conductors; electric magnetic circuit elements. Maxwell's equations and boundary condition problems in one, two, and three dimensional space. Plane electromagnetic waves and power flow. Three hours lecture a week. (same as EE 331)

Prerequisites: Mth 211, Phy 202.

PHY 332. ELECTRICITY & MAGNETISM II **Three credits**

Development of Maxwell's equations and boundary-value problems. Plane wave propagation and reflection from boundaries; the Poynting Theorem; Transmission lines and strip lines; impedance transformation and Smith Charts; guided TEM, TE, and TM waves; radiation from dipole antenna. Three hours lecture a week. (same as EE 332)

Prerequisite: Phy 331/EE 331.

PHY 333. ELECTRICITY & MAGNETISM LAB I **One credit**

Laboratory experiments are performed which illustrate fundamental electromagnetic field concepts in distributed systems and in lumped element circuits. Experiments are partially planned by the students and reported both formally and informally. One three-hour laboratory a week. Fee: $40. (same as EE 333)

Corequisite: Phy 331/EE 331.

PHY 334. ELECTRICITY & MAGNETISM LAB II **One credit**

A continuation of Phy 333 with emphasis on transmission line concepts and the interaction of electromagnetic fields and matter. One three-hour laboratory a week. Fee: $40. (same as EE 334)

Prerequisite: Phy 333/EE 333.

PHY 336. OPTICS AND LIGHT **Three credits**

The principles of geometrical and physical optics are considered in considerably greater detail than in the introductory course. Image formation, refraction, diffraction, origin of spectra, polarized light, optical activity, etc. Three hours of class per week.

Prerequisite: Phy 106 or 202.

PHY 340. THERMODYNAMICS **Three credits**

The fundamental concepts and laws of thermodynamics. Carnot cycle, entropy and applications. Kinetic theory, statistical mechanics, and applications to fundamental systems. Lecture-discussion three hours a week.

Prerequisites: Phy 106 or 202, Mth 211 or 212.

PHY 351. QUANTUM MECHANICS **Three credits**

An introduction to Quantum mechanics. Schrodinger's equation and its application to the potential-well, the harmonic oscillator, and the hydrogen atom. Angular momentum perturbation theory. Identical particles; Pauli's exclusion principle. The Dirac relativistic wave equation and the origin of electron spin. Lecture-discussion three hours a week.

Prerequisites: Phy 301 or 310, Mth 361.

PHY 361. ATOMIC PHYSICS **Three credits**

Planck's theory of cavity radiation, photons, and the particle aspect of radiation, the wavelike properties of particles, Schroedinger's theory of quantum mechanics, one-electron atoms, special functions, use of recursion relations to evaluate selection rules, X-ray and optical excitations of multi-electron atoms, application of group theory to the normal modes of molecules, quantum statistics with simple applications to solids. Three hours lecture-discussion a week.

Prerequisite: Phy 203.

PHY 363. ATOMIC PHYSICS LABORATORY **One credit**

Experiments are chosen to illustrate the practical aspects of atomic theory. Properties of blackbody radiation; photoelectric effect; compton scattering; fine structure, isotope, and zeeman splitting of spectral lines; X-ray line spectra and Moseley's Law; X-ray diffraction from crystals, etc. One three-hour laboratory a week. Fee: $40.

Prerequisite: Phy 221.

Corequisite: Phy 361.

PHY 370. INTRODUCTION TO SOLID STATE PHYSICS **Three credits**

Introduction to bonding and crystal structure, symmetry considerations, recriprocal lattice considerations, lattice dynamics, electronic structure of simple metals, insulators, and semiconductors, dielectric, ferroelectric, and magnetic properties of materials. Three-hour lecture.

Prerequisite: Phy 203.

PHY 380. NUCLEAR PHYSICS **Three credits**

Some properties of nuclei: size, density, shape; the nuclear force; models of nuclear structure; unstable nuclei; radioactive decay; alpha decay, Gamow's theory; beta decay; Fermi's theory; gamma decay and the Moessbauer effect; nuclear reactions, the excited states of nuclei; fission and reactors; fusion and reactors; fusion, the origin of the chemical elements; elementary particles; unification. Lecture-discussion three hours a week.

Prerequisite: Phy 203.

PHY 382. NUCLEAR PHYSICS LABORATORY **One credit**

An introduction to some tools and techniques of nuclear physics. Nuclear magnetic resonance; particle counting; vacuum techniques; proton-proton scattering; multi-channel analyzers and beta spectra; dating techniques; field trips to experimental and power reactors, etc. Three hours a week. Fee: $40.

Prerequisite: Phy 221.

Corequisite: Phy 380.

PHY 390. PRACTICUM **Three credits**

Training assignment under the direct supervision of a working professional in a specialty appropriate to the student's curriculum. Participating institutions such as hospitals, laboratories, and industrial or academic facilities will cooperate in this training. Can be repeated for credit.

Prerequisite: Department approval.

PHY 391. SENIOR PROJECTS I **One credit**

Design and development of selected projects in physics and other related fields under the direction of a staff member. Technical as well as economic factors will be considered in the design. A professional paper and detailed progress report are required.

Prerequisite: Senior standing in physics.

PHY 392. SENIOR PROJECTS II — **Two credits**

Design and development of selected projects in physics and other related fields under the direction of a staff member. Technical as well as economic factors will be considered in the design. A professional paper to be presented and discussed in an open forum is required.

Prerequisite: Senior standing in physics.

PHY 393. ADVANCED LABORATORY I — **Two credits**

A laboratory course of experiments and projects in fundamental and applied physics, concentrating on lasers and modern optics. One four and one-half hour meeting per week. Fee: $45.

Prerequisites: Phy 221, junior or senior standing in the sciences.

PHY 394. ADVANCED LABORATORY II — **Two credits**

A laboratory course of experiments and projects in fundamental and applied physics, concentrating on atomic physics, nuclear physics, and physical properties of materials, including the interaction of radiation with materials. One four and one-half hour meeting per week. Fee: $45.

Prerequisites: Phy 221, junior or senior standing in the sciences.

PHY 395-396. INDEPENDENT RESEARCH — **One to three credits**

Independent study and research for advanced students in the field of physics under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.

Prerequisites: Senior standing and approval of department chairperson.

PHY 397. SENIOR SEMINAR — **One to three credits**

Presentations and discussion of selected topics.

Prerequisite: Senior standing or by special departmental permission.

PHY 399. COOPERATIVE EDUCATION — **Three or six credits**

Professional cooperative education placement in a private/public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See page 62 in Bulletin for placement procedures.)

Prerequisites: Sophomore standing, 2.0 cumulative average, consent of academic advisor, approval of placement by department chairperson.

PHY 198/298/398. TOPICS IN PHYSICS — **Variable credit**

Selected topics in the field of physics. These may include one or more of the following: astronomy; geophysics; biophysics; nuclear power & waste; relativity; quantum mechanics; semiconductors; cryogenics; health physics. May be repeated for credit.

Prerequisite: Varies with topic studied.

PRE-MEDICAL STUDIES

Dr. Ralph B. Rozelle, Dean of Health Sciences.

Overview

Wilkes University offers pre-medical studies programs which share a fundamental and formative premise — that unprecedented technological and scientific dynamism will characterize the context of medical careers conducted in the next thirty to fifty years. Such dynamism has important implications for the future physician's baccalaureate studies, including the need to master computer-based information access systems, to reach a level of mastery in the sciences permitting independent judgment and research, and to grow in ethical sensitivity and sophistication. Drawing on the University's strengths in science, information systems, engineering, and the humanities, Wilkes has defined an approach to pre-medical education which produces exceptionally competent, and competitive, candidates for admission to the nation's leading schools of medicine.

The Wilkes pre-medical graduate stands out first of all because he or she is not only broadly trained but also has mastered the new and rapidly evolving medical information technologies. Throughout the science curriculum at Wilkes, students are exposed to and use databases which relate fully up-to-date information at the cutting edge of research in science fields. Interviews with medical school professors and admissions officers indicate that such information access skills are increasingly relevant and will soon be essential for the medical practitioner. As a comprehensive university, with a full range of bachelor's and master's degree programs in engineering, computer science, and the natural sciences, Wilkes provides a sophisticated, research-capable science environment, in which students learn how to negotiate the information-rich, but highly complex world of scientific database communications.

The future medical practitioner will also be called upon to assess and implement promising information emerging in the fields of molecular biology, biochemistry, cell biology, and organic chemistry. A general exposure to science at the undergraduate level, typical of liberal arts college pre-medical studies, will no longer be sufficient to prepare medical students and practitioners to be fully competent as professionals. Wilkes's science-intensive pre-medical program involves students in research projects and applications activities during their undergraduate years and helps them thereby to gain real mastery as scientists able to make independent judgments and to conceptualize and conduct independent research. The new medicine makes obsolete the former dichotomous categorization of science and pre-professional studies, in that the superior physician will increasingly have to be a research-capable scientist him or herself. Pre-medical studies at Wilkes have adapted to this trend well in advance of programs at most other institutions.

Databased information and scientific dynamism make more, not less, necessary attention to the moral and ethical dimensions of pre-medical studies. Through its nationally recognized program of core curricular studies, Wilkes provides the future physician with highly meaningful learning experience in philosophy, ethics, and social problems. The Wilkes Core includes a special seminar in Culture and Value, recommended for all pre-medical students, which examines the foundations of distinct and often contradictory approaches to issues of ethics and social policy. Pre-medical students are also advised to complete both Introduction to Philosophy and Ethics as parts of their general studies curricula. These learning experiences are augmented by the robust atmosphere of intellectual discussion and debate, which has long been one of Wilkes's distinguishing institutional characteristics, as a non-denominational, non-sectarian university at which issues of morality and ethics are taken seriously. In this way, as in other areas, Wilkes prepares its pre-medical students for the real world in which they will function as professionals.

The descriptions of courses and curricula, which follow, put into practice what we at Wilkes believe to be a forward-looking program of pre-medical studies.

Advisement and Curricula

The Pre-Medical Program at Wilkes University offers a variety of opportunities for students to prepare for medical school. Wilkes enjoys an enviable record of placement of students in medical school, with acceptance rates of over 90%. Allopathic medical schools accepting Wilkes-prepared students include Thomas Jefferson University, Hahnemann University, Medical College of Pennsylvania, Pennsylvania State University, Temple University, University of Pennsylvania, and the University of Pittsburgh in Pennsylvania, as well as such nationally recognized medical schools as Harvard, Stanford, George Washington, Georgetown, Tulane and Yale. A number of Wilkes students also enter Osteopathic Medical schools, such as the Philadelphia College of Osteopathic Medicine.

A truly unique feature of Wilkes University for pre-medical students is an elaborate counselling system. Students are advised by faculty in academic departments, the pre-professional advisor and clinical psychologists. It is the function of these faculty overseers in the advisory system to assure that students are entering a professional field for which they are well-suited and well-prepared, and which they have investigated thoroughly in a professional environment such as a hospital or professional office.

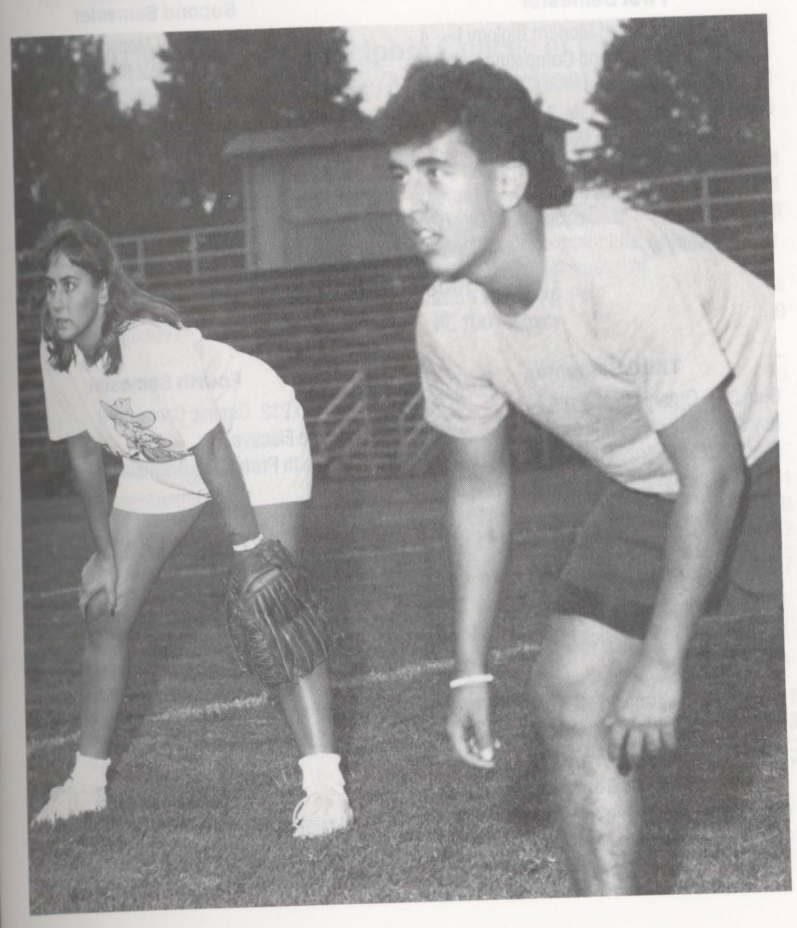
The pre-medical curriculum at Wilkes University offers a broad range of choice of academic majors to students. Many major in biology, chemistry or one of the other basic sciences although students have majored in mathematics, engineering, English, etc. and have gained admission to medical

school. Medical schools are generally interested in students who have depth training in the sciences along with a broad background in the humanities and social sciences.

The core basic science requirements for most medical schools are as follows:

2 courses in biology
4 courses in chemistry (including organic chemistry)
2 courses in physics
2 courses in mathematics (calculus)

The program of study in the pre-medical programs follows the semester by semester outline given in other parts of this Bulletin and is listed under the academic majors such as Biology or Chemistry. Any pre-doctoral baccalaureate program of study, however, must include the above basic science prerequisites.



Allopathic Medicine

Students who wish to pursue a career in Allopathic Medicine enroll in a curriculum which will allow them to fulfill the basic science requirements for medical school which are listed below:

2 courses in biology
4 courses in chemistry
2 courses in physics
2 courses in calculus

Many students elect a biology major which would automatically include the above courses. However, students have the option of choosing other majors depending on their interests.

An academic program for the allopathic pre-medical student would follow a format similar to the following:

First Semester

Bio 121 Principles of Modern Biology I	4
Chm 115 Elements and Compounds	4
Eng 101 Composition I	3
Mth 105 Calculus for Life, Managerial, and Social Sciences I **or**	
Mth 111 Calculus I	4
CST 101 Core Studies I	1
Free Electives	0-2
PE 100 Activity	0
	16-18

Second Semester

Bio 122 Principles of Modern Biology II	4
Chm 116 The Chemical Reaction	4
Eng 102 Composition II	3
Mth 106 Calculus for Life, Managerial, and Social Sciences II **or**	
Mth 112 Calculus II	4
Free Electives	0-3
PE 100 Activity	0
	15-18

Third Semester

Chm 231 Organic Chemistry I	4
Psy 101 General Psychology	3
Free Electives	8-11
	15-18

Fourth Semester

Chm 232 Organic Chemistry II	4
Free Electives	11-14
Health Profession Orientation	0
	15-18

Fifth Semester

Phy 105 Introductory Physics **or**	
Phy 201 General Physics I	4
Free Electives	12-14
	16-18

Sixth Semester

Phy 106 Introductory Physics **or**	
Phy 202 General Physics II	4
Free Electives	12-14
	16-18

Seventh Semester

Major Requirements and Electives	15
	15

Eighth Semester

Major Requirements and Electives	15
	15

Osteopathic Medicine

Wilkes University and the Philadelphia College of Osteopathic Medicine (PCOM) have instituted a "Seven-Year Doctoral Program in Medicine."

The overall academic program requires students to complete three years in basic sciences and liberal arts education at Wilkes University and four years of medical education at Philadelphia College of Osteopathic Medicine.

Fifteen (15) qualified students per year will be admitted to PCOM at the end of their third year at Wilkes University. Following successful completion of their first year of basic science education in medical school, Wilkes will transfer thirty-six credits in the basic sciences and confer upon each the Bachelor of Science degree.

The program is governed by a Joint Admissions Committee of faculty members from both Wilkes University and PCOM who make recommendations of candidates for admission to medical school to the PCOM Committee on Admissions.

Wilkes University/Philadelphia College of Osteopathic Medicine Undergraduate/Medical School Program

First Semester

Bio 121 Principles of Modern Biology	4
Chm 115 Elements and Compounds	4
Eng 101 Composition I	3
Mth 105 Calculus for Life, Managerial, and Social Sciences I **or**	
Mth 111 Calculus I	4
CST 101 Core Studies I	1
PE 100 Activity	0
	16

Second Semester

Bio 122 Principles of Modern Biology II	4
Chm 116 The Chemical Reaction	4
Eng 102 Composition II	3
Mth 106 Calculus for Life, Managerial, and Social Sciences II **or**	
Mth 112 Calculus II	4
PE 100 Activity	0
	15

Third Semester

Chm 231 Organic Chemistry I	4
Free Electives*	9-10
Psy 101 General Psychology	3
	16-17

Fourth Semester

Chm 232 Organic Chemistry II	4
Free Electives*	9-10
Psy Elective	3
	16-17

Fifth Semester

Phy 105 Introductory Physics **or**	
Phy 201 General Physics I	4
Free Electives*	12-13
	16-17

Sixth Semester

Phy 106 Introductory Physics **or**	
Phy 202 General Physics II	4
Free Electives*	12-13
	16-17

*Electives include courses to satisfy the broad educational requirements of the Wilkes University Core Curriculum.

Additional elective credits will be selected from the sciences to extend depth education in disciplines such as Biology and Chemistry. **Chemistry 361, Biochemistry,** is strongly recommended by the Joint Wilkes – PCOM Admissions Committee as an elective.

Transfer Credits from Philadelphia College of Osteopathic Medicine

Anatomy	14
Biochemistry	7
Microbiology	6
Physiology	9
	36
Total Credits	132-134
Degree	Bachelor of Science

Special Preprofessional Degree Program

Four years of undergraduate study ordinarily are required to qualify for the bachelor's degree. Wilkes University makes an exception in special circumstances to this requirement for doctoral students in medicine.

These students may, with the approval of the Academic Standards Committee, satisfy the requirements for the bachelor's degree by completing three years of an academic major, at least the last two of which must be at Wilkes, and by requesting credit toward the degree for their first two years of work in professional school. Students in these programs must, however, satisfy the Core Requirements at Wilkes University to be considered for a bachelor's degree from the University.

Such students must also petition the Academic Standards Committee for permission to graduate, submit official transcripts from the professional school, and pay the usual graduation fees. In all cases the **final approval for the granting of the degree rests with the Academic Standards Committee of Wilkes University.**



University-wide Core Studies Courses

CORE STUDIES

The following courses are interdisciplinary offerings which are included in the Core Curriculum.

CST 101. CORE STUDIES I **One credit**
The course introduces entering students to skills and perspectives which facilitate academic success in college. The course meets one period weekly. Students who matriculate at Wilkes with 15 or more credits of college or university course-work may elect to exempt Core Studies I with credit.

CST 201. CORE STUDIES IN CULTURE AND VALUE **Three credits**
A study of the seminal ideas and issues in world history and cultures, offered in Distribution Area I of the Core, Culture and Value.

CST 202. CORE STUDIES IN SCIENCE AND TECHNOLOGY **Three credits**
A study of fundamental issues and principles in science and technology, offered in Distribution Area II of the Core, The Scientific World.

CST 203. CORE STUDIES IN SOCIETY AND HUMAN BEHAVIOR **Three credits**
A participatory discussion of issues and concerns of the social and behavioral sciences, offered in Distribution Area III of the Core.

CST 204. CORE STUDIES IN ARTISTIC EXPRESSION **Three credits**
Special topics in art, music, and theater are explored as a general education experience in Distribution Area IV of the Core.

CST 298. CRITICAL THINKING **Three credits**
An analysis of modes of discourse with the purpose of enhancing the student's ability to evaluate arguments and assertions from a critical perspective. Also offered as Phl 298, which also may be used as a core studies course in Distribution Area I.



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SCOTT BODFISH (1989), Director of Institutional Research and Planning, Office of the President
B. Phil. Ohio, M.A. Washington (MO)

Academic Affairs

Office of the Vice President for Academic Affairs

GEORGE W. WALDNER (1987), Vice President for Academic Affairs
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B.S., M.S. Wilkes, Ed.D. Temple

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B.S., M.Ed. Pennsylvania State

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BRUCE PHAIR (1980), Director of Dorothy Dickson Darte Center for Performing Arts
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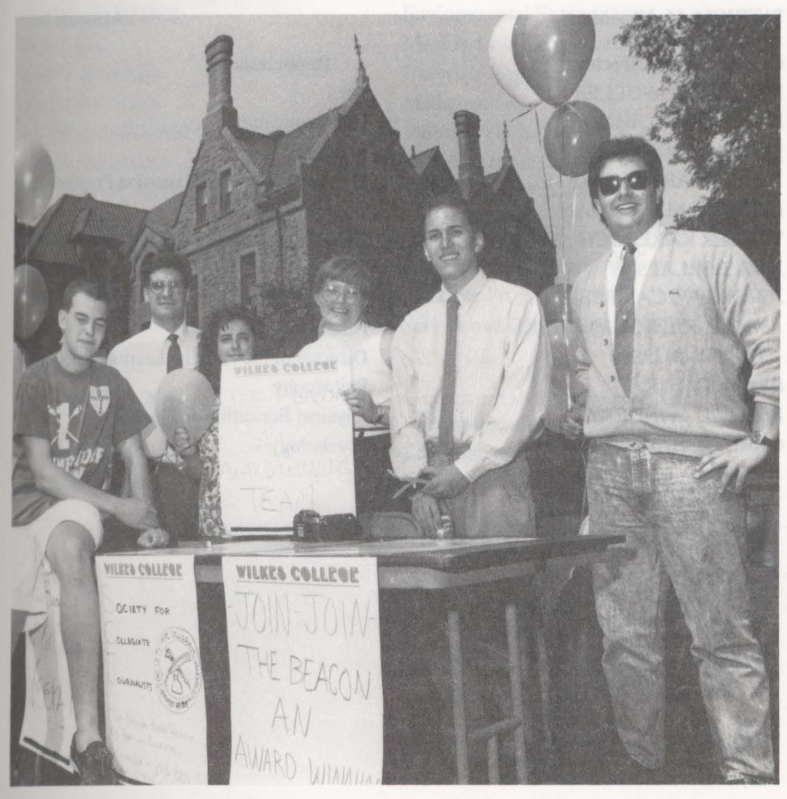

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MERLE J. PEPER — Associate Dean

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MERLE J. PEPER
ASHIM K. BASU
THEODORE J. ENGEL, Acting
JOHN H. NATZKE

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PATRICIA M. HEAMAN — Associate Dean

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CARL J. CHARNETSKI

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Foreign Languages and Literature
History
Music, Theater, Dance
Nursing
Director of the Nursing Learning Laboratory
Philosophy
Physical Education and Health
Psychology

The School of Sciences and Engineering

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BRIAN T. REDMOND — Associate Dean

Health Sciences Programs

RALPH B. ROZELLE — Dean

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LESTER T. TUROCZI — Biology
HOWARD A. SWAIN, JR. — Chemistry
BRIAN T. REDMOND, Acting — Earth and Environmental Sciences
AHMAD ARMAND — Engineering
SAMUEL MERRILL, III — Mathematics and Computer Science
ROGER MAXWELL — Physics

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AHMAD ARMAND — Electrical Engineering
TO BE ANNOUNCED — Engineering Management
DANIEL PINDZOLA — Environmental Engineering
TAHEE LEE — Manufacturing Engineering Option
JOHN J. JANECEK — Materials Engineering
LOUISE BERARD — Mathematics
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ALI RAZAVI — Material Processing and Testing

Faculty

In alphabetical order, with date of appointment following the name.

CHRISTOPHER N. BREISETH (1984), Professor of History/President
B.A. California, Los Angeles, B. Litt. Oxford, Ph.D. Cornell

GEORGE W. WALDNER (1987), Professor of Political Science/Vice President for Academic Affairs
A.B. Cornell, M.A., Ph.D. Princeton

* * * * * * * * * * * * * * * *

HOLIDAY EVE ADAIR (1990), Assistant Professor of Psychology
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BRUCE E. AUERBACH (1988), Assistant Professor of Political Science
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B.A. Sienna, M.A. SUNY, Binghamton

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M.A., Ph.D. Claremont Graduate School

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SHARON BOWAR (1990), Assistant Professor of Art
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Wilkes University Learning Center . . . . . .H
Writing Laboratory. . . . . .H

Building Key

Symbol	Building and Location
A	Annette Evans Faculty and Alumni House, 146 South River Street
B	Chase Hall, 184 South River Street
C	Church Hall, 187 South Franklin Street
D	Conyngham Student Center, 130 South River Street
E	Dorothy Dickson Darte Center for the Performing Arts, Corner of River and South Streets
F	Eugene Shedden Farley Library, Corner of Franklin and South Streets
G	Hollenback Hall, 192 South Franklin Street
H	Kirby Hall, Corner of River and South Streets
I	Marts Center, 272-274 South Franklin Street
J	Max Roth Center, 215 South Franklin Street
K	Pickering Hall, Wright Street
L	Slocum Hall, 262-264 South River Street
M	Sturdevant Hall, 129 South Franklin Street
N	Weckesser Annex, Rear 170 South Franklin Street
O	Weckesser Hall, 170 South Franklin Street
P	136 South Franklin Street



WILKES UNIVERSITY
1990-91 ACADEMIC CALENDAR

Summer 1990 – First Day Session

Classes Commence	Monday, June 11, 1990	8:00 a.m.
Classes End	Friday, July 13, 1990	12:00 noon
	(Including Final Examinations)	

Second Day Session

Classes Commence	Monday, July 16, 1990	8:00 a.m.
Classes End	Friday, August 17, 1990	12:00 noon
	(Including Final Examinations)	

Eight-Week Evening Session

Classes Commence	Monday, June 11, 1990	6:00 p.m.
Classes End	Friday, August 3, 1990	10:00 p.m.
	(Including Final Examinations)	

Fall Semester – 1990

Classes Commence	Wednesday, August 29, 1990	8:00 a.m.
(Classes will be held on Labor Day, September 3, 1990)		
Fall Recess	Friday, October 5, 1990	5:00 p.m.
Classes Resume	Wednesday, October 10, 1990	8:00 a.m.
Thanksgiving Recess	Tuesday, November 20, 1990	10:00 p.m.
Classes Resume	Monday, November 26, 1990	8:00 a.m.
Classes End	Tuesday, December 11, 1990	10:00 p.m.
Final Examinations Begin	Thursday, December 13, 1990	8:30 a.m.
Final Examinations End	Friday, December 21, 1990	4:30 p.m.

Intersession	Wednesday, January 2, 1991 to Friday, January 18, 1991	

Spring Semester – 1991

Classes Commence	Monday, January 21, 1991	8:00 a.m.
Winter Recess	Thursday, February 14, 1991	10:00 p.m.
Classes Resume	Tuesday, February 19, 1991	8:00 a.m.
Spring and Easter Recess	Friday, March 22, 1991	5:00 p.m.
Classes Resume	Tuesday, April 2, 1991	8:00 a.m.
Follow Friday Class Schedule	Tuesday, May 7, 1991	
Classes End	Wednesday, May 8, 1991	10:00 p.m.
	(Follow Monday Class Schedule)	
Final Examinations Begin	Friday, May 10, 1991	8:30 a.m.
Final Examinations End	Saturday, May 18, 1991	4:30 p.m.

Commencement	Saturday, May 25, 1991	4:00 p.m.

1990-91
WILKES UNIVERSITY

Graduate Bulletin

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WILKES UNIVERSITY

1990-1991

GRADUATE BULLETIN

WILKES UNIVERSITY
Wilkes-Barre, Pennsylvania 18766
Telephone (717) 824-4651

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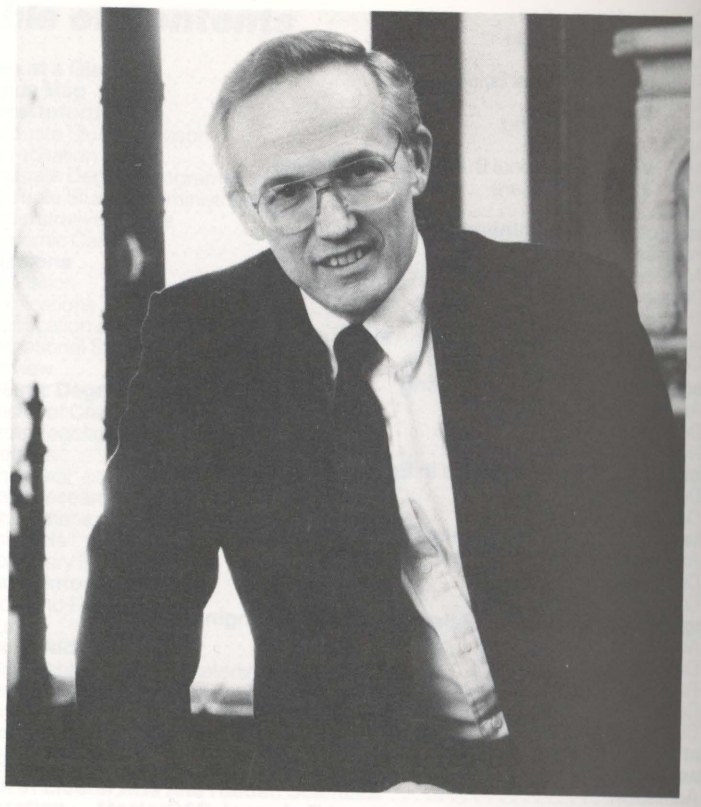


The President's Message

Graduate education at Wilkes University is designed to meet the educational needs of students continuing their studies immediately following their undergraduate work and for established professionals who seek to enhance their credentials. You will find that the close faculty-student contact for which Wilkes is known also characterizes graduate instruction. Part of our mission as a comprehensive institution of higher education is to help adults pursue their educational goals, while strengthening the breadth and sophistication of the labor force in Northeast Pennsylvania.

A more fundamental objective than this pragmatic goal, is the University's commitment to offer a graduate education that challenges and enriches students' lives, intellectually, culturally, and socially.

Christopher N. Breiseth
President

Wilkes At A Glance

Wilkes University was founded in 1933 when Bucknell University established a branch junior college in Wilkes-Barre. In 1947, Bucknell University Junior College became Wilkes College, a four-year, coeducational, liberal arts institution. In 1959, graduate programs were added to the curriculum. With continued expansion, in both graduate and undergraduate programs, the University reorganized itself into a School of Business, Society and Public Policy, School of Liberal Arts and Human Sciences and School of Science and Engineering. This new structure serves approximately 1,700 full-time day students, 600 part-time students, and over 1,500 graduate students. Thus, Wilkes has emerged to be a true comprehensive institution of higher education.

THE WILKES TRADITION

Community Service

Founded in 1933 as a junior college, Wilkes came into existence in the midst of the economic crisis caused by the simultaneous collapse of anthracite coal mining and the onset of the Great Depression. Wilkes mission was to make higher education accessible to ambitious but underprivileged youth and to produce new leadership for an area in dire need of renewal and hope for the future. After World War II, Wilkes responded again to a community need, transforming itself into a four-year college to aid in the massive task of preparing returning veterans for challenging and rewarding careers. More recently, Wilkes has developed into a comprehensive institution, offering a broad range of bachelor's and master's degree programs, continuing the College's tradition of service to the community through educational programs of high quality and direct relevance to the area's economic and cultural development. On January 1, 1990, Wilkes was officially granted University status.

Academic Excellence With Human Understanding

Wilkes' mission has been shaped in fundamental ways by the unique perspective on education of Eugene Shedden Farley, Wilkes president for more than thirty-five years, who possessed a distinctive vision of higher education — a vision articulated in his collected works, *Essays of an Educator.* Dr. Farley advocated a rigorous academic program which would require students to meet high standards and enable them to compete successfully in leading graduate and professional schools. Moreover, Dr. Farley's Quaker background led him to place equally strong emphasis on education's role in cultivating individual integrity, personal responsibility, and sensitivity to the beliefs and customs of persons from diverse cultural backgrounds. Wilkes' tradition of recruiting an ethnically and religiously diverse faculty and student body and ensuring that campus clubs and associations welcome all students as members can be traced to Dr. Farley's guidance of the College in its formative years. The only independent, non-denominational, four-year college in the region,

Wilkes has fulfilled a special role in building a close-knit campus community composed of persons from a wide variety of traditions and points of view. As a result, academic excellence in a context of tolerance and diversity had come to be a strong component of the Wilkes tradition.

Purpose: Education and Service for a Dynamic Future

While a cherished tradition may provide inspiration and suggest broad guidelines, the question of institutional purpose must be continually examined in light of developments in society and technology. Specifically, Wilkes must strive to identify purposes and conduct programs which will be of value to its students and the community in the social and technological environment of the future.

Society will continue to be in a state of constant, transforming change in response to new information, technological advances, and unanticipated developments. A society characterized by extensive change demands education which prepares individuals and communities to be flexible and adaptive, ready to benefit from innovation. In particular, those in leadership positions must be educated to manage successive waves of change and to channel those changes productively. Wilkes' overarching imperative must be to educate its students and help the surrounding community to flourish in a setting of technological and societal dynamism.

Wilkes defines its major purpose as the education of men and women to develop essential intellectual skills, to master the core concepts and principles of their chosen fields and disciplines, to be sensitive to aesthetic concerns and ethical issues, and to be well prepared to adapt to change in their careers and in community life. The University is committed to conduct applied research and outreach programs which will facilitate economic and cultural progress in the region while enriching the educational experiences of students and faculty members. By excelling in these approaches to teaching, research, and service, Wilkes aims to contribute to the supply of human resources and applied knowledge needed for a more prosperous, cultured, and humane society.

Graduate Programs

In the last decade, Wilkes has increased substantially its engagement in graduate programs at the master's degree level in the arts and sciences as well as professional fields. Emphasis has been placed on programs that are responsive to student needs for career advancement and the institution's role in applied research and outreach to the region. The graduate program, viewed as a whole, has the following defining and distinctive goals:

1. A focus on programs designed for persons who are seeking personal growth, career advancement, and professional development.
2. Concentration on graduate degree programs intended to advance the economic and cultural development of the region.

3. Engagement in outreach programs which link external organizations with campus academic life and provide opportunities for applied research to graduate students and faculty members.
4. A multi-disciplinary approach to graduate studies, emphasizing breadth and adaptability to changing professional and societal conditions.
5. The development of carefully structured cooperative agreements, which provide for the offering of other institutions' programs on the Wilkes campus and the offering of Wilkes' programs on other campuses in the region.
6. Concentration on graduate programs in fields which are already strong in terms of faculty, facilities, and library resources at the undergraduate level and which will be augmented by graduate level offerings.

Wilkes envisions an expanding role in graduate education; however, the primary focus of the institution will remain on excellence in undergraduate studies.

In Conclusion

The faculty, administration, and Board of Trustees continually assess the purposes and goals of Wilkes University and the programs designed to attain them. The unchanging principle guiding the University is to provide educational opportunities and outreach services which are responsive to student and community needs and consistent with Wilkes' tradition of service, excellence, and diversity.

BUILDINGS AND FACILITIES

The **E. S. Farley Library,** named for the first president of Wilkes, exists to provide its users with effective access to recorded information. The Library has acquired a substantial collection of carefully selected materials in a variety of formats and media, including nearly 200,000 volumes, 1,220 current journal and newspaper subscriptions, and over 500,000 microforms. Particular subject strengths include English literature, American cultural history, and the history of science. The Farley Library's automated catalog system enables users to search the various collections at Wilkes (books, journals, and audiovisual materials) by author, title, and subject on public access terminals. Online database searching is available to students and faculty through the Reference Department of the Library. Special facilities include a microcomputer lab, special collections rooms, audio/visual resources and microform equipment. Library collections are supplemented by cooperative arrangements with other libraries. Through a variety of printed and online sources, the Library is able to identify and locate virtually any published materials needed by Library users.

The **Dorothy Dickson Darte Center for the Performing Arts,** dedicated in 1965 and the gift of Dorothy Dickson Darte, features a fully-

equipped, 500-seat theater on a site deeded to Wilkes by the Wyoming Valley Society of Arts and Sciences. It contains a scene shop, dressing rooms, rehearsal areas, costume rooms, hydraulic lift forestage, patch panel with 246 circuits, and a 10-scene preset with 60 dimmers. The facility is well-equipped for instructional use and regularly used for college and community presentations.

The **Dorothy Dickson Darte Music Building** opened in the summer of 1969 as the second phase of the Center for the Performing Arts. It houses faculty offices, studios, classrooms, practice and rehearsal rooms, and it is the centerpiece for the Wilkes' highly regarded music programs. Concerts and recitals are regularly presented in Gies Recital hall and are open to the public.

The **Sordoni Art Gallery,** given to Wilkes in 1973 by The Andrew J. Sordoni Foundation, Inc. is located in Stark Learning Center adjacent to the Department of Art. The main purpose of this modern facility is to present art exhibitions to enrich the lives of the Wilkes community and the region. Exhibitions are supplemented by lectures, tours, demonstrations, and related arts programs. A growing permanent collection embraces all media but is particularly strong in nineteenth and twentieth century American and European paintings and a print collection which includes old masters as well as contemporary artists. The Gallery is a particularly valuable study facility for students.

Stark Learning Center, named in honor of the late Admiral Harold R. Stark who was an Honorary Chairman of Wilkes Board of Trustees, opened in 1958 and was expanded in 1973. Stark Learning Center is the major instructional facility on campus, and it provides approximately 85,000 square feet of modern classroom, laboratory, studio and office space. It houses the Departments of Art, Biology, Chemistry, Earth and Environmental Sciences, Education, Engineering, Mathematics and Computer Science, Philosophy, Physics, and Psychology as well as the University's Computer Support Center.

The **Computer Support Center** supports the academic and administrative functions of Wilkes 24 hours a day 7 days a week, including the automation of the University's library operation. Academic support provides assistance of faculty as well as students in the areas of program conversion and development. The Data General MV 10000 with 8-MBytes of main memory and 1.4-GBytes of disc space supports 110 terminals and peripherals used not only for programming but also for word processing (TIPS), engineering (SPICE, ANSYS, SUPREM), statistics (SPSS, MINITAB, BMDP), science (IMSL), simulation (SLAMII), and a variety of applications including CAD. A variety of microcomputers (Apple IIe, Apple Macintosh, and IBM PC) are available to students in clusters throughout Stark Learning Center and in some laboratories. They are available for instructional as well as individual student use during normal university hours; additional hours are posted at the beginning of each term. These units offer a large and growing variety of software in-

cluding wordprocessing, graphics, CAD, spreadsheet, database management, and simulation. The Hewlett Packard 3000/68 with 5-MBytes of memory and 2.5-GBytes of disc space supports terminals used by all administrative offices in their daily operations.

The **Conyngham Student Center,** refurbished by the Conyngham family and friends, is a multi-functional unit available to individual students and student organizations for activities and relaxation. It includes a snack bar and game room and provides a pleasant meeting place for students and faculty alike. It also houses the offices of the Deans of Student Affairs.

The **Arnaud C. Marts Sports and Conference Center** and **Outdoor Recreational Plant** provide space for organized intramural and intercollegiate athletic events as well as wellness and leisure-time activities for individual students. The new multi-purpose center provides for academic conferences, lectures, and seminars. In addition to playing fields for baseball, softball, field hockey, soccer, and football, the University has a weight room and asphalt tennis court. Wilkes actively promotes use of all its facilities by all constituencies of the University.

Wilkes University's **Residence Halls** house 900 students in a variety of living arrangements in facilities ranging from stately Victorian and Tudor mansions to the ultra-modern accommodations of Evans Hall. Each residence hall is staffed by graduate or undergraduate Resident Assistants, who provide guidance and supervision and assist in the development of a constructive learning environment. Available to all single full-time students, full-time undergraduate students who are under 18 years of age are **required** to live in university residence halls during their first and second semesters unless they have been granted permission from the Residence Life Office to reside off campus or they commute from the home of their parents or legal guardian. Detailed information regarding residence halls and residence life can be obtained from the Office of Admissions or the Residence Life Office.

General Information 1990-1991

Wilkes University is an equal opportunity and affirmative action institution. No applicant shall be denied admission to Wilkes because of race, color, sex, religion, national or ethnic origin, or handicap.

Wilkes reserves the right to change the requirements and regulations contained in this bulletin and determine whether a student has met its requirements for admission or graduation, and to reject any applicant for admission for any reason the University determines to be material to the applicant's qualifications to pursue graduate education.

GRADUATE STUDIES DIVISION

The Graduate Division of Wilkes was established in 1959 when the Board of Trustees authorized graduate study in the Departments of Chemistry and Physics. The first Master of Science Degrees were conferred in 1965. The Graduate Studies activities are currently administered through the Division of Graduate Studies and Adult Education.

The graduate programs are designed to provide the opportunity for completion of a Master's Degree in one or two years of full-time study. Cycling of graduate courses allows a full-time student to plan for continuous progress in his program.

The programs also allow businessmen, engineers, scientists, teachers, and others employed in the region to continue their studies without interrupting their employment. To permit a combination of work and study, many classes are scheduled to meet during late afternoon and early evening hours.

ACCREDITATION

Wilkes Graduate Programs are approved by the Department of Education of the Commonwealth of Pennsylvania and accredited by the Middle States Association of Colleges and Secondary Schools.

In addition to the total program accreditation, certain special areas are recognized by professional societies.

Wilkes University is a member of the Council of Graduate Schools in the United States, Pennsylvania Association of Graduate Schools and an Associate Member of the Association of University Programs in Health Administration (AUPHA).

GRADUATE DEGREE PROGRAMS

DEGREE	Programs
Master of Business Administration, M.B.A.	Business Administration (Concentrations Available: Marketing, Managerial Science, Labor, Accounting, Finance, Health Care)
Master of Health Administration, M.H.A.	Health Care Administration
Master of Science, M.S.	Mathematics, Nursing and Physics
Master of Science in Electrical Engineering, M.S.E.E.	Electrical Engineering
Master of Science in Education, M.S. Ed.	Education Elementary Education Secondary Education/Biology Secondary Education/Chemistry Secondary Education/English Secondary Education/History Secondary Education/Mathematics Secondary Education/Physics Options: Educational Computing Educational Development and Strategies

Wilkes University Graduate Studies Administration

Dr. Christopher N. Breiseth — *President*
Dr. George W. Waldner — *Vice President for Academic Affairs*
Dr. Mahmoud H. Fahmy — *Dean of Graduate Studies and Adult Education*

The academic programs at Wilkes University are located in three degree-granting units:

School of Business, Society and Public Policy
Mr. Theodore J. Engel, *Dean*

School of Liberal Arts and Human Sciences
Dr. James P. Rodechko, *Dean*

School of Science and Engineering
Dr. Umid R. Nejib, *Dean*

Departments are grouped as follows:

The School of Business, Society and Public Policy:

Accounting	Health Care Administration
Business Administration	Political Science/Public Administration
Economics	Sociology

The School of Liberal Arts and Human Sciences:

Art	Music, Theater, and Dance
Communications	Nursing
Education	Philosophy
English	Physical Education
Foreign Languages	Psychology
History	

The School of Science and Engineering:

Biology	Engineering
Chemistry	Mathematics/Computer Science
Earth and Environmental Science	Physics

Administrative Offices (717) 824-4651

Division of Graduate Studies and Adult Education
Dr. Mahmoud H. Fahmy, *Dean*

Graduate Office Extension 4462	Second Floor, Max Roth Center 215 South Franklin Street Wilkes-Barre, PA 18766
Office of Continuing Education (Non-Credit Programs) Extension 4466, 4467	Second Floor, Max Roth Center
Office of Evening, Summer, and Weekend (Undergraduate) Extension 4235, 4237	Third Floor, Max Roth Center
Financial Management Office Extension 4650	First Floor, Sturdevant Hall 129 South Franklin Street
Financial Aid Office Extension 4345	Second Floor, Sturdevant Hall 129 South Franklin Street
International Students Advisor Extension 4400	Second Floor, Chase Hall 184 South River Street
Registrar's Office Extension 4853	Marts Sports & Conference Center Room 202, 274 S. Franklin Street
Recorder's Office Extension 4855	Marts Sports & Conference Center Room 202, 274 S. Franklin Street

Toll-free from Scranton, Pennsylvania 342-5617
From elsewhere in Pennsylvania (800) 572-4444
From Middle-Atlantic and New England Regions (800) 537-4444

FALL SEMESTER — 1990

Registration — Graduate registration begins for the Fall Semester
Wednesday, August 1 — 8:30 a.m. to 4:30 p.m.

Extended registration for Graduate Courses
Wednesday, August 22 — 8:30 a.m. to 8:00 p.m.
Thursday, August 23 — 8:30 a.m. to 8:00 p.m.

Classes Commence
Wednesday, August 29 — 8:00 a.m.

Opening Convocation and Commencement
Thursday, August 30 — 11:15 a.m.
(Classes will be held on Labor Day, September 3)

Fall Recess
Friday, October 5 — 5:00 p.m.

Classes Resume
Wednesday, October 10 — 8:00 a.m.

Thanksgiving Recess
Tuesday, November 20 — 10:00 p.m.

Classes Resume
Monday, November 26 — 8:00 a.m.

Classes End
Tuesday, December 11 — 10:00 p.m.

Final Examinations Begin
Thursday, December 13 — 8:30 p.m.

Final Examinations End
Friday, December 21 — 4:30 p.m.

Intercessions 1991
Wednesday, January 2, 1991
to Friday, January 18, 1991

SPRING SEMESTER — 1991

Registration — Graduate registration begins for the Spring Semester
Monday, December 10, 1990 — 8:30 a.m. to 4:30 p.m.

Extended registration for Graduate Courses
Wednesday, January 16 — 8:30 a.m. to 8:00 p.m.
Thursday, January 17 — 8:30 a.m. to 8:00 p.m.

Classes Commence
Monday, January 21 — 8:00 a.m.

Winter Commencement
Thursday, January 24 — 11:15 a.m.

Winter Recess
Thursday, February 14 — 10:00 p.m.

Classes Resume
Tuesday, February 19 — 8:00 a.m.

Spring and Easter Recess
Friday, March 22 — 5:00 p.m.
(Easter Sunday is March 31, 1991)

Classes Resume
Tuesday, April 2 — 8:00 a.m.

FOLLOW FRIDAY CLASS SCHEDULE
Tuesday, May 7

Classes End
Wednesday, May 8
(Follow Monday class schedule)

Final Examinations Begin
Friday, May 10 — 8:30 a.m.

Final Examinations End
Saturday, May 18 — 4:30 p.m.

Commencement
Saturday, May 25 — 4:00 p.m.

SUMMER 1991

First Day Session

Registration — Graduate registration begins for the Summer Sessions
Monday, June 3, 1991 — 8:30 a.m. to 4:30 p.m.
Extended registration for Graduate Courses
Wednesday, June 5 — 8:30 a.m. to 8:00 p.m.
Thursday, June 6 — 8:30 a.m. to 8:00 p.m.

Classes Commence
Monday, June 10 — 8:00 a.m.

Classes End
Friday, July 12
(Including Final Examinations) — 12:00 noon

Second Day Session

Classes Commence
Monday, July 15 — 8:00 a.m.

Classes End
Friday, August 16
(Including Final Examinations) — 12:00 noon

Eight-Week Evening Session

Classes Commence
Monday, June 10 — 6:00 p.m.

Classes End
Friday, August 2
(Including Final Examinations) — 10:00 p.m.

Last date for Graduate Assistantship for the 1991-92 Academic Year, is March 1, 1991

Approved Thesis submission, May 1, 1991, (prior to graduation) — (Student Affair)

For further information, write or call:

Dr. Mahmoud H. Fahmy, *Dean*
Division of Graduate Studies and Adult Education
Wilkes University
Wilkes-Barre, PA 18766
Phone: (717) 824-4651, Extension 4462
Toll-free from Scranton, PA 342-5617
From elsewhere in Pennsylvania (800) 572-4444
From Middle-Atlantic and New England Regions (800) 537-4444

Admissions

APPLICATION

Applicants interested in graduate programs offered at Wilkes should apply to the Division of Graduate Studies and Adult Education. They should contact the office to obtain the forms and information needed to proceed with their application. They must fill out the "Application for Graduate Admission" form and arrange for the submission of official transcripts of all previous college work. All departments also require letters of recommendation and some may require Graduate Record Examination scores or the scores of other advanced tests used in their fields.

Students, other than international students, who are unable to complete the application process prior to the beginning of the semester in which entrance is desired will be allowed special admission to the program pending processing of their applications. This policy does not imply acceptance of the special student into the degree program. Students failing to complete the application process by the beginning of the second semester after their initial application may be denied the right to register for courses.

TO ALL APPLICANTS:
Incomplete application (i.e. not processed, no academic advisor, no approved program) will be held for no more than two years. After this period of time it will be invalid and the applicant will need to file a new application.

QUALIFICATIONS

For admission to the Division of Graduate Studies an applicant must have received, from an accredited institution, a baccalaureate degree earned under residence and credit conditions substantially equivalent to those required by Wilkes. Ordinarily, an entering student must have completed in a satisfactory manner a minimum of course work in designated areas, the specific courses and amount of work depending upon the field of advanced study.

Admission is granted to the student by the Dean of the Division of Graduate Studies according to the established standards set by the Schools in which the student plans to study.

Although the Division of Graduate Studies has no fixed minimum grade point requirement for admission, it is expected that candidates for admission shall have good or above-average performance during their undergraduate years and shall exhibit evidence of intellectual and temperamental fitness for graduate study.

Specific departmental requirements established for each area of study are to be found herein. Each applicant should consult these require-

ments prior to filing an application. A student whose background is judged to be deficient in any specific area of his field of study or whose undergraduate grades are below standard may be asked to remedy the deficiency by taking one or more courses at the undergraduate level, without graduate credit.

The objective of the Graduate Division is to admit a qualified graduate student up to the limit of the University's resources to provide outstanding graduate programs.

CLASSIFICATION OF STUDENTS

A graduate student may be admitted either as a degree student or special non-degree, depending upon the student's objectives. After admission to one of these categories, any change to the other must be arranged through the Dean of Graduate Studies.

SPECIAL NON-DEGREE

Students are allowed to register as special non-degree. They must complete the Application for Admission forms, check status desired (special non-degree) and pay the application fee. Special non-degree applicants are allowed to accumulate up to six credits only. Upon the completion of the six credits, they must declare their intention of change of status to degree candidate status.

DEGREE CANDIDATES

Pending for those who apply for candidacy either part-time or full-time and have not completed their admission process (i.e. have not received a letter of admission and been assigned an academic advisor) may register for up to six credits pending the completion of credentials review. Such students must secure the signature of the Graduate Dean in order to register.

Provisional admission is a temporary classification in which a student may remain until completion of 12 graduate credits and undergraduate prerequisites, if any. A provisional degree student who wishes to petition for regular admission must submit a written request and an official transcript to the Dean of Graduate Studies. Credits earned as a provisional degree student or a non-degree student may be accepted in a degree program only upon the recommendation of the student advisor. An applicant accepted as a provisional student will be permitted to take a maximum of 12 graduate credits as a provisional student.

Provisional students will be assigned academic advisors immediately upon the beginning of their studies.

Regular admission is granted to students who have demonstrated an acceptable level of academic work in their undergraduate program and are prepared for work at the graduate level in their field of specialization.

Full-time graduate students must have official permission of the Graduate Dean to enroll or continue enrollment as a full-time degree student.

Note that nine credits per semester is considered to be full-time for graduate students.

Undergraduate students at Wilkes may be permitted to enroll in certain graduate courses with the approval of the Advisor, Department Chairpersons, Deans of the Schools and the Dean of Graduate Studies. Credit for such courses will be at the undergraduate level. Under certain conditions an undergraduate student may be permitted to register for graduate credit. In no case will a student be given both undergraduate and graduate credit for any course. Students are not allowed to register in graduate courses numbered 500.

AUDITING

A person desiring to audit a course does not need to meet normal admission requirements, but, must obtain approval to audit from the department chairperson or program director, the course professor and the Dean of Graduate Studies. Auditors must file the formal application for admission to the Graduate Division. The student cannot receive credit for courses taken as an auditor.

Changing to Auditor Status

A student enrolled in a course may apply to become an auditor by completing a change-in class-status form available at the Graduate Office and must obtain necessary approval from the Advisor, Course Professor and the Dean of Graduate Studies. This change of status cannot be made no later than the first two weeks of the class.

INTERNATIONAL STUDENTS

International students should plan to apply at least three months prior to the beginning of the semester or summer sessions in which they intend to begin graduate studies. They must submit two certified English translations of all academic records.

All applicants whose native language is not English must take the TOEFL (Test of English as a Foreign Language) and submit the results of this test with the application for admission. A student must present a minimum TOEFL score of 550 to be considered for admission to the Graduate Division.

It is required that each international student should submit an affidavit of support indicating that the applicant is able to cover one full year of tuition plus living expenses in the United States.

The Immigration and Naturalization Service of the United States Department of Justice requires a certificate of eligibility (Form 1-20A) to be initiated by the university and completed by the student prior to his application for student visa to study in this country. Any extension of stay or

employment while the United States must have the prior approval of the regional office of the Immigration and Naturalization Service.

International students may be required to take certain courses for undergraduate credit not applicable to the Master's Degree. In some cases these courses will be specified in the admissions letter but the Dean of Graduate Studies may make additional requirements if a student is found to be deficient in the English language or in background knowledge in his field.

All international students should register their names with the International Student Advisor as soon as they arrive. The International Student Advisor, second floor Chase Hall, serves as advisor on non-academic matters to all international students. Services provided include counseling on housing, visa problems and other difficulties in adjusting to life in the United States.

International Students should officially notify the Dean of Graduate Studies and the International Student Advisor of any change of address or departing the United States.

INTERVIEW

All applicants for the graduate programs who intend to enroll as full-time students **MUST** arrange for an interview with the Dean of Graduate Studies. International students, upon their arrival to the United States, should arrange for an interview with the Dean of Graduate Studies.

The Dean of Graduate Studies, Deans of Academic Units, Department Chairpersons, and Director of Programs reserve the right to request an interview with any applicant to the Graduate Program.

Academic Degree Requirements

Students may be awarded the master's degree upon satisfaction of all general college requirements for graduation and the following specific requirements:

1. Admission to graduate study as a **regular** student;
2. Satisfactory completion of all requirements for the degree to be completed within six calendar years preceding the date of the granting of the degree; **(If extension of six-year limit is needed, a request should be submitted in a written form to the Dean of Graduate Studies.) The request of extension forms are available at the Graduate Office.**
3. Maintenance of a minimum average of 3.0 for all graduate work;
4. Completion of specific School requirements;
5. If a thesis is required, the candidate should:
   a. Be accepted by a thesis Advisor and an Advisory Committee, before completion of nine hours of graduate study;
   b. Submit an acceptable thesis in the required format and quantity of copies not later than **May 1** preceding the commencement at which the degree is to be conferred;
   c. Complete arrangements for publication of the thesis, if so directed, satisfactory to the Advisory Committee.

Specific requirements for graduate degrees will be found within each School.

Required core courses of any of the programs CANNOT be substituted with any other course.

TRANSFER CREDITS

A maximum of 6 credits of high quality graduate work done at another accredited and recognized institution may be applied toward the requirements for the Master's degree.

Approval to apply any transferred credits toward a degree program must be granted by the Chairperson of the Department or the Program Director. Transferred academic work must have been completed within **six years** prior to the date of the admission to the Graduate program at Wilkes, with a grade B or better. Pass-Fail grades are not transferable to an advanced degree program unless the "Pass" can be substantiated by the former institution as having a grade of B or better. **Grades earned in all transferable courses are not included in the computation of the cumulative grade point average.**

All requests for transfer of credits should be submitted to the Registrar's Office where forms for transfer of credit may be obtained.

GRADE REGULATIONS

Numerical grades are given for graduate work:

4.0 = A — Academic achievement of superior quality

3.5 = B + — Academic achievement of good quality

3.0 = B — Academic achievement of acceptable quality in meeting requirements for graduation

2.5 = C + — Academic achievement of adequate quality but below the average required for graduation

2.0 = C — Academic below graduate level expectation

0.0 = F — Failure – Below the minimum required for graduate course credit

A grade of "X" indicates assigned work yet to be completed in a given course. Except in thesis work, grades of "X" will be given only in exceptional circumstances. Grades of "X" must be removed through satisfactory completion of all course work no later than four weeks after the end of the final examination period. Failure to complete required work within this time period will result in the conversion of the grade to 0. **Further extension of time allowed for the completion of work should be endorsed by the instructor in the form of a written statement and submitted to the Dean of Graduate Studies. Formal approval will be granted by the Dean of Graduate Studies who will inform the Registrar's Office.**

Students who earn more than two grades below 3.0 in any of the Graduate Courses may be ineligible for continuation in the Graduate Program.

To achieve more flexibility and to promote advancement of knowledge, the Division of Graduate Studies has provided the opportunity to acquire a series of one-credit courses. Such courses must meet the following requirements:

1. Students should be evaluated by the instructor and receive grades using the same graduate course grading system presently in use at the University.
2. Such courses should involve 15 hours of class time or its equivalent.
3. Such courses must be approved by the departments offering the courses and by the Dean of Graduate Studies.
4. Instructors for such courses must be approved by the department's offering the courses and by the Dean of Graduate Studies.
5. Such courses may not be used in place of any core requirements in a graduate degree program, but may be used as elective in such programs.
6. The total number of credits earned in such courses which may be applied toward a graduate degree program may not exceed six credits.

RETENTION

A student admitted to graduate study must maintain a grade average of 3.00 or better in all graduate work for retention in the Graduate Program. A student whose grade-point average drops below a 3.00 will be placed on probation, suspended from graduate study, or dismissed from the Graduate Program. Decisions in such matters will be made by the Dean of Graduate Studies in consultation with the deans of the Schools, the Chairperson of the appropriate department in accordance with the regulations of the School and of the Division of Graduate Studies. A student who is suspended from graduate study or dismissed from the Graduate Program may request a review of the case by the Faculty Committee on Graduate Studies. The request should be submitted in **written form** to the Dean of Graduate Studies.

REGULATIONS FOR WITHDRAWAL

A grade of "W" indicates an authorized withdrawal from a course. **A graduate student wishing to withdraw from a course must secure a withdrawal form from the Office of the Registrar and have it approved by the instructor, and the dean of the respective school. Failure to secure authorized withdrawal for a course not completed will result in a grade of 0.**

For those who wish to add or drop a course you may secure the forms from the Office of the Registrar and have it approved by the instructor, and the dean of the respective school.

CHANGE OF DEGREE PROGRAM, MAJOR OR CONCENTRATION

In case of changing program, major or concentration, students must submit a petition of the Dean of Graduate Studies stating the reason of such change.

REGULATIONS ON THESIS RESEARCH

Each graduate student shall select a major advisor under whose direction he wishes to pursue his thesis research, if a thesis is required. Following acceptance of the candidate, the advisor shall appoint two other members of the Graduate Faculty to serve with him as the student's Advisory Committee.

Part-time students employed in laboratories on a full-time basis may be permitted to conduct their thesis research in these laboratories if a mutually satisfactory agreement can be reached by the student, the laboratory staff, and the University. In such cases, a qualified member of the staff of the employer shall be named by the Dean of Graduate Studies to serve as a member of the student's Advisory Committee. He shall also be appointed an adjunct professor of the University and shall supervise the day-to-day progress of the student's research.

THESIS POLICY

1. Upon approval of the thesis topic, the student and the advisor shall meet to identify the objectives, to develop a timetable, and plan the distribution of credits across that timetable. This written plan is to be made part of the student's files in the department office and the Graduate Office.
2. The student shall be continuously registered for a minimum of one thesis credit up to and including the semester that he/she defends the thesis and submits the final copy of the thesis.
3. The thesis objectives should be completed within the allocated number of credits and within the timetable developed; however, circumstances and the uncertainties associated with research and project work may require subsequent adjustments to the credits allocated and the timetable. Such adjustments shall also become part of the student's files in the department office and the Graduate Office.
4. Students registered for thesis credits will be awarded a grade reflecting the level and the quality of work conducted for that semester. Incomplete and audit designations are explicitly excluded as thesis grades.
5. The satisfactory completion of the thesis is indicated by passing the oral examination and obtaining the necessary approvals from the Thesis Committee, the Department Chair, the School Dean, and the Dean of Graduate Studies.
6. Student appeals to any provisions in this policy shall be to the Thesis Advisor, the Department, the School, and finally to the Dean of Graduate Studies and the Graduate Studies Committee.

The original and two copies of the thesis must be submitted to the Dean of Graduate Studies after the thesis has been approved by the Advisory Committee. One copy will be filed in the Library, one in the Graduate Office and one in the appropriate department. If the student desires a personal copy bound, an additional copy should be furnished. For thesis binding fees, see under fees and expenses.

EXAMINATIONS AND TESTS

Challenge Examinations: Students who desire to remove undergraduate deficiencies may submit to challenge examinations. This cannot be used to earn credits toward the graduate degree. Arrangements are made by the student directly with the major department head or program chairperson. A fee for the challenge examination is $20 per credit.

Comprehensive Examination: All Comprehensive Examination applications must be submitted to the Dean of Graduate Studies. Applications must be obtained at the office of Graduate Studies. The fee of the comprehensive exam for the MBA program is $25.00 and is to be paid by

check or money order (payable to Wilkes) at the Financial Management Office.

MBA Comprehensive Exam Schedule as follows:

Comprehensive Exam	November 3, 1990
Prep-session	October 6, 1990
Comprehensive Exam	April 6, 1991
Prep-session	March 2, 1991
Comprehensive Exam	November 2, 1991
Prep-session	October 5, 1991

Graduate Management Admission Test:
Graduate Record Examination:

Scores from the G.M.A.T. or G.R.E. are required for some degree programs. The applicant should consult the appropriate program admission requirements.

Both tests are administered by the Educational Testing Service, Box 955, Princeton, New Jersey 08540. Application forms and data may be obtained by writing directly to E.T.S. Application forms must be filed with E.T.S. at least thirty (30) days to the date of any examination.

G.R.E. (Graduate Record Examinations) Date of tests:
October 13, 1990, December 8, 1990
February 2, 1991, April 13, 1991, June 1, 1991

G.M.A.T. (Graduate Management Admission) Test:
October 20, 1990, January 19, 1991
March 16, 1991, June 15, 1991

Miller Analogies Test: Some degree programs require students to take the Miller Analogies Test. For further information or assistance, please contact the Graduate Office, and the Testing Service Office.

TRANSCRIPTS

Transcripts are provided by the Office of the Recorder. They are issued only upon written request by the student, and should be requested at least three weeks prior to the date needed. A student requesting a transcript in person must present valid identification.

Transcripts given directly or mailed to students do not carry the university seal and are not official. The seal is attached only when the transcript is mailed directly from the University to another college or authorized agency.

There is no charge for the first transcript requested from Wilkes. The student will pay two dollars for each additional transcript.

A transcript of work completed at any college must be requested by the student to be sent directly from that institution to Wilkes Graduate Office.

DISCIPLINARY PROCEDURES

Graduate students are obligated to observe the regulations governing all students of Wilkes University relative to:

1. Academic honesty and integrity
2. Respect for the rights of others relative to their safety, welfare and educational commitments
3. The safety and security of the entire community.

Any disciplinary cases arising from a lack of observance of these regulations will be adjudicated by the Dean of the Graduate Division and the Dean of Student Affairs. These two Deans shall have the responsibility of hearing such cases with the Chairperson of Graduate Studies Committee and a student.

Any appeals from the decisions of this Committee may be made in written form to the Vice President for Academic Affairs.

Financial Information

TUITION AND FEES

All Payments for tuition, room and board, fees, etc., are due at the time registration forms are processed.

Payment of all charges for tuition, fees, room and board is to be made at the Financial Management Office, Sturdevant Hall. Several plans have been developed to assist students who do not have the cash in hand, and it is suggested these plans be considered when special assistance is needed. Students may consult with the Director of Financial Aid for information regarding scholarship and loan programs.

Subject to the regulations concerning refunds, the total tuition is considered fully earned by the university upon completion of registration by the student.

Application Fee: $25.
Tuition Cost per Semester: $255 per credit hour.
General Fee: $4 per credit hour.
Graduation Fee: $90 (Charged to all graduating students in their last semester.)
Thesis Binding Fee: $15.00 per copy.
Transcript Fee: The first transcript is free of charge; the fee for the second and subsequent transcripts is $2 per copy.
Individual departments have the right to charge laboratory and breakage fees as appropriate.

The Financial Management Office is prohibited from signing graduation clearance forms until the outstanding balance is paid in full. Graduates who have requested the deferred payment option must pay the final semester balances personally before clearance forms are signed or have a written guarantee from their employer that the amount will be paid to Wilkes regardless of course completion or final grade. Those prospective graduates not complying with the above policy will not be cleared until actual cash payment is received from their employer.

Third-Party Billing and Deferred Payment forms may be picked up at the Financial Management Office. **These forms must be submitted each semester.**

REFUNDS

Students who have paid their tuition in full and who withdraw from courses or from the University during the time limits indicated below will receive tuition refunds, upon written request to the Comptroller's Office, according to the following formula.

	Time of withdrawal	Tuition refund
Academic Year:	First two weeks	80%
	Third and fourth week	60%
	Fifth week	40%
	After fifth week	No refund
5-week Summer Sessions:	First week	50%
8-week Summer Session:	First two weeks	50%

Financial Aid

ASSISTANTSHIPS AND COUNSELORSHIPS

The University awards a limited number of Graduate Assistantships. Applications for these assistantships **must be filed with the Dean of Graduate Studies no later than March 1, 1991, for the 1991-92 academic year.**

A number of counselorships in undergraduate residence halls are available each year to graduate students. Applications for these positions must be filed with the Director of Housing no later than February 1 to be considered for the academic year beginning in September.

CRITERIA FOR SELECTING GRADUATE ASSISTANTSHIPS

1. Admission to the program and full-time status.
2. Full-time (nine credits per semester) status while holding the assistantship.
3. Minimum 3.0 undergraduate grade point average. Current graduate students may apply for an assistantship after completion of nine semester hours of graduate credit with a cumulative average of 3.0 or higher.
4. Two additional letters of recommendation and submission of personal resume (character reference if needed).
5. Successful interview or equivalent assessment of suitability for an assistantship.
6. Ability and willingness to perform the duties assigned by the department and/or the supervisor.

INSTITUTIONAL AND FINANCIAL ASSISTANCE INFORMATION

The following concerning student financial assistance may be obtained from Director of Financial Aid, 129 S. Franklin St.

1. Student financial assistance programs available to students who enroll at Wilkes;
2. The method by which such assistance is distributed among student recipients who enroll at Wilkes;
3. The means, including forms, by which application for student financial assistance is made; the requirement for accurately preparing such applications; and the review standards employed to make awards for student financial assistance.

Alumni Discount

Wilkes encourages graduates of the University to continue their education. Therefore, alumni qualify for a 10% discount on tuition for undergraduate and graduate courses. A written request for this discount should be submitted to the Financial Aid Office at the time of registration.

LOANS

There are several federal and Pennsylvania State loan programs available to graduate students. While each has its unique characteristics, there are some standardized features which apply to all of the following loans. In order to qualify, a student must be accepted as a degree candidate, must be a U.S. citizen or permanent resident, must be enrolled on at least a half-time basis and must be in good academic standing according to the academic progress standard set for receipt of federal aid. To determine eligibility, all students must complete the PHEAA/Federal Student Aid Application and must obtain a Financial Aid Transcript from each post-secondary institution attended. These forms are available at the Financial Aid Office.

IMPORTANT TERMS

Academic Grade Level: Each graduate program is divided into two grade levels; the first 15 graduate credits are grade level 6 and the remainder of the program is grade level 7.

Academic Progress: For continued participation in the loan programs, students must meet specific academic progress requirements which include the successful completion of a specific number of credits based on their enrollment status and the maintaining of a 3.0 cumulative grade point average.

Enrollment Status: Full-time is 9 graduate credits per semester; half-time is 6 graduate credits per semester.

Graduate Student: A student who has been officially accepted as a candidate in a graduate degree program.

STAFFORD LOANS (formerly GSL)

The subsidized Stafford Loan is a federal program that enables students to borrow money from a bank, credit union, savings and loan, or other participating lenders. It is available to graduate students who are enrolled on at least a half-time basis and who show financial need. The loan is interest-free while the borrower is enrolled at least half-time and for the first six months following termination of such enrollment. Graduate students may apply for $7,500 per academic grade level.

Interest at the rate of 8% begins to accrue the seventh month after the student ceases to be enrolled on at least a half-time basis. If the borrower has a previous Stafford Loan, the interest rate remains the same as that of the first loan, provided there is an outstanding balance on the loan. Any student who borrows for the first time after July 1, 1988, will pay 8% interest for the first four years of repayment and 10% interest for the remainder of the repayment period.

Repayment of principal and interest begins six months after the student ceases to be enrolled on at least a half-time basis.

Applications may be obtained from your local lending institution.

PLUS/SLS

The PLUS/SLS loan is a market-rate, non-need-based loan made by a bank, credit union, savings and loan association or other participating lender. The maximum amount that can be borrowed is $4,000 per academic grade level with an aggregate limit of $20,000.

The current interest rate is 10.45% and repayment begins 60 days after the loan proceeds have been disbursed. The interest rate is adjusted annually. There are deferment allowances for student borrowers.

PLUS/SLS applications may be obtained from any lending institution which participates in this program.

PHEAA-HELP STAFFORD LOAN

The PHEAA-HELP Stafford Loan is a *nonsubsidized* loan. Under the federal *subsidized* Stafford Loan, the government pays interest on the loan while the student is enrolled in college. However, under PHEAA's program, it is the borrower who is responsible for making the interest payments while the student is attending college. This loan is for students who do not qualify because of lack of financial need for any or all funds under the subsidized Stafford Loan program.

A borrower who is eligible for a portion of the federal Stafford Loan may borrow the difference from the PHEAA-HELP Stafford Loan program with the minimum loan being $500. The maximum loan limit includes a combination of the subsidized and nonsubsidized loan.

The borrower is expected to make quarterly interest payments while the student is enrolled in college. The current interest rate is 8% per year.

Repayments of the principal begins six months after the student is no longer enrolled on at least a half-time basis. For new borrowers after July 1, 1988, the interest rate is 8% for the first four years of repayment and 10% for the remainder of the repayment period.

The program is available to students who are residents of Pennsylvania or to non-Pennsylvania residents who attend Pennsylvania colleges or universities.

If the student applies for the subsidized Stafford Loan and is rejected because of lack of financial need or if the approved amount is less than the amount requested, the Stafford Loan application becomes a PHEAA-HELP Stafford Loan application. Because of this feature, it is recommended that out-of-state students obtain a PHEAA Stafford Loan application form from a lender in Pennsylvania or the Wilkes University Financial Aid Office.

PHEAA-HELP ALTERNATE LOAN

Under the PHEAA-HELP Alternate Loan Program, the borrower may request amounts up to $10,000 per academic grade level. This amount includes any funds received under the Stafford Loan Program. Graduate

students may apply but must have a credit-eligible co-applicant. The current interest rate is 9.5% and is adjusted annually.

Repayment of interest and principal begins within 30 days of receipt of loan proceeds. Either the borrower or co-applicant is responsible for making monthly interest and principal payments.

For reasons of financial hardship approved by PHEAA, the borrower and co-applicant may request that the principal, or both the principal and interest, be deferred while the student is enrolled.

Applications are available at the Wilkes University Financial Aid Office.

GRADUATION

All graduate students are expected to participate in commencement exercises which are held during the academic year.

August
January
May

IT IS THE RESPONSIBILITY OF THE GRADUATE STUDENT TO INFORM THE GRADUATE OFFICE NO LATER THEN NINETY DAYS PRIOR TO THE DATE OF THE COMMENCEMENTS.

ATTENTION ALL MASTER DEGREE GRADUATES

You must sign up for GR-000-B "0" credit on your final semester registration form.

School of Liberal Arts and Human Sciences

James P. Rodechko, (Ph.D.) *Dean*
Patricia B. Heaman, (Ph.D.) *Associate Dean*

Education

Michael W. Heikkinen (Ph.D.) *Chairperson*

Master of Science in Education

PURPOSE

Graduate study in education is offered primarily to enable teachers to enhance their preparation for classroom leadership. Study in various academic fields is required as well as in professional courses. Sufficient flexibility is provided, however, to permit others interested in education to arrange programs of study appropriate to their interests.

Programs are offered in Education (with options in Education, Educational Computing, and Educational Development and Strategies); Elementary Education, Secondary Education/Biology; Secondary Education/Chemistry; Secondary Education/English; Secondary Education/History; Secondary Education/Mathematics; and Secondary Education/Physics.

Wilkes University has been designated as a Regional Computer Resource Center. This center was established in 1984 as part of the Information Technology for the Commonwealth (ITEC) Act adopted and funded by the Pennsylvania General Assembly. The Center at Wilkes is one of 14 across the Commonwealth created to enhance the microcomputer literacy among classroom teachers in Pennsylvania.

The Regional Computer Resource Center provides the following services:

1. Free graduate level computer literacy courses to K-12 teachers in Pennsylvania's public and nonpublic schools;
2. Teacher training in microcomputer topics such as software evaluation via short workshops and seminars;
3. Assistance to school districts in designing computer-oriented curricula;
4. Dissemination of information about ITEC grants for the acquisition of hardware and courseware by school districts.

The Regional Computer Resource Center is administered by the Pennsylvania Higher Education Assistance Agency.

SPECIAL FEATURES OF THE PROGRAM

The program is arranged so that students may pursue the degree on a full- or part-time basis. Late afternoon and evening classes are offered to enable full-time teachers within a reasonable distance from Wilkes-Barre to take courses toward fulfillment of degree requirements during the academic year. Credits may also be earned during the summer sessions.

ADMISSION

For admission to graduate study in education, the applicant must have a baccalaureate degree from an accredited institution, with an appropriate major, and a teaching certificate.

Students deficient in any phase of requirements may, at the discretion of the academic department, the Education Department, and the Dean of Graduate Studies, be granted provisional admission. Deficiencies must be made up satisfactorily before full admission to graduate study will be granted.

Students who do not wish to earn a degree are invited to request "special non-degree" admission status.

DEGREE REQUIREMENTS

All candidates for the Master of Science in Education degree must complete a program of at least thirty credits; twelve credits must be in education, six in Area I and three in Area II.

A candidate for the Master of Science in Education Degree whose program is in Education must earn nine credits in one Area in education, beyond the twelve-credit basic requirement, and must (a) take Education 525 and complete a thesis for which three credits may be granted, or must (b) complete a total program of thirty-six credits.

A candidate for a Master of Science in Education with an option in Educational Computing must complete six credits in Area I, and Education 522, 581, 582, 583, 585, 587, 588, and 589.

A candidate for the Master of Science in Education who is a practicing teacher may elect the option in Educational Development and Strategies. The requirements for this degree are: Two courses in Area I; one course in Area II, Ed 534 or 541; four three-credit PLS courses: Project T.E.A.C.H., P.R.I.D.E., Teaching Through Learning Channels, and Patterns for I.D.E.A.S.; and six elective credits in education.

A candidate for the Master of Science in Education degree whose program is in elementary education must take three courses in the Education 532 series and Education 534.

A candidate for the Master of Science in Education degree whose program is one of the secondary school teaching subjects must complete eighteen credits in the appropriate cognate area; three of the twelve credits in education must be in Area IV.

PROGRAM OF STUDY

Each student develops a program of study which will satisfy requirements for the degree. The program must be approved by his advisor and by the Education Department. To facilitate securing this approval, students in secondary education are assigned a co-advisor in the Cognate Area.

SECOND MASTERS' DEGREE

An applicant who has a Master's Degree from Wilkes University or is working on a Master's Degree, may obtain a second Master's Degree if the majors, programs and/or options are different. Up to six credits of course work used to satisfy the requirements for the first degree may be applied to the second; all other catalog requirements and credit requirements in courses must be fulfilled. A student who opts for a second degree **MUST** submit a written request to the Dean of Graduate Studies.

AREA I — FOUNDATIONS OF EDUCATION

EDUCATION 510.
PSYCHOLOGICAL FOUNDATIONS OF EDUCATION **Three credits**

A study of human development and learning, application of psychological principles in the practice of education.

EDUCATION 511.
PHILOSOPHICAL FOUNDATIONS OF EDUCATION **Three credits**

An examination of philosophical issues which bear upon American education. The problem of relating theory to practice is considered.

EDUCATION 512. SOCIAL FOUNDATIONS OF EDUCATION **Three credits**

An introduction to the history, scope, materials and methods of the sociological analysis of education. Instruction includes the concepts of culture, socialization, stratification, social control and change as they relate to formal education.

EDUCATION 513.
COMPARATIVE FOUNDATIONS OF EDUCATION **Three credits**

An analytic study of educational patterns in contemporary societies. Educational policies and institutions are studied in their cultural context. Educational patterns of developed and developing nations are described, analyzed and compared; examples from each pattern are examined.

EDUCATION 514.
HISTORICAL FOUNDATIONS OF EDUCATION **Three credits**

A survey of the great landmarks of Western education from antiquity to the recent past. The development of primary, secondary, and higher education; objectives; curricula; methods; and systems of education are considered. Attention is given to some contemporary problems in their historical perspectives.

AREA II — PROFESSIONAL SKILLS IN EDUCATION

EDUCATION 520. TESTS AND MEASUREMENTS **Three credits**

Study of characteristics, construction, and use of various standardized and non-standardized measuring instruments; statistics through basic correlation.

EDUCATION 521. STATISTICS IN EDUCATION **Three credits**

Correlation and regression through statistical inference.

Prerequisite: Education 520 or equivalent.

EDUCATION 522.
EDUCATION STATISTICS AND COMPUTER SIMULATION **Three credits**

This course utilizes the microcomputer for statistical inference. Students also have experiences in system modeling and techniques to simplify and represent relationships in complex problems.

EDUCATION 525. EDUCATIONAL RESEARCH I **Three credits**

A study of procedures used to collect, analyze and present data; critical examination of representative educational research reports.

Prerequisite: Education 520 or equivalent.

AREA III — ELEMENTARY EDUCATION

EDUCATION 531. CHILDREN'S LITERATURE **Three credits**

A study of methods and materials appropriate for elementary school instruction in literature.

EDUCATION 532-533.
PROBLEMS IN ELEMENTARY EDUCATION **Three credits**

Advanced study of materials and methodology appropriate for elementary classroom instruction.

Section A Mathematics
B Science
C Language Arts
D Social Studies
E Special Subjects

EDUCATION 534. ELEMENTARY SCHOOL CURRICULUM **Three credits**

A study of curricula offered in elementary schools, grade placement of content, articulation of subject matter areas, development of specialized programs.

Prerequisite: Fifteen graduate credits.

EDUCATION 536. ELEMENTARY
SCHOOL READING INSTRUCTION **Three credits**

Lectures and demonstrations cover the psychology of the reading process, appraisal of reading needs, directed reading activities, word recognition and comprehension abilities.

EDUCATION 537. READING DISABILITIES **Three credits**

Lectures and demonstrations cover the identification, diagnosis, and classification of individuals with reading problems at all ages and levels of instruction.

Prerequisite: Education 536.

AREA IV — EDUCATIONAL COMPUTING COURSES

EDUCATION 580. COMPUTER LITERACY **Three credits**

The essential elements of programming in the BASIC language for microcomputers and its use in instructional programming.

EDUCATION 581. ADVANCED BASIC FOR INSTRUCTIONAL PROGRAMMING **Three credits**

This course includes random, sequential and direct-access files, sorting, searching, modeling, graphics and simulation. Emphasis is on the application in instructional environments.

Prerequisite: Prior computer experience.

EDUCATION 582. INSTRUCTIONAL PROGRAMMING IN PASCAL **Three credits**

PASCAL for microcomputers. Emphasis will be on the use of this structured programming for classroom instruction and the preparation for teaching the AP course in computing.

EDUCATION 583. MACHINE LANGUAGE **Three credits**

Basic principles of machine language programming. Computer organization and representation of numbers, strings, arrays, list structures at the machine level.

Prerequisite: One course in a high-level language.

EDUCATION 584. LOGO **Three credits**

Introduction to computer programming using the LOGO language. Topics included are turtle graphics; writing procedures that use numbers, words and lists; LOGO syntax; using recursion to deal with words and lists, and using lists to represent complex data structures.

EDUCATION 585. MICROCOMPUTER-ASSISTED INSTRUCTION **Three credits**

Design, development and testing of microcomputer-assisted instructional units as tutorial, simulation, and drill, using the PILOT language.

Prerequisite: One course in a high-level language.

EDUCATION 586. MICROCOMPUTERS IN EDUCATION **Three credits**

An analysis of microcomputer applications designed for use in various educational settings. Special emphasis is placed on software evaluation.

Section A Mathematics
B Science
C Language Arts
D Social Studies
E Special Topics

EDUCATION 587. MICROCOMPUTER DATA STRUCTURES **Three credits**

The use of a high-level language to implement complex data structures. These include lists, trees, graphs, networks and storage allocation.

Prerequisite: One course in a high-level language.

EDUCATION 588. MICROCOMPUTER ORGANIZATION
AND OPERATING SYSTEMS **Three credits**

The study of architecture and design of present day microcomputer systems. Common operating systems will be examined along with their support hardware and software.

Prerequisite: Ed 587.

EDUCATION 589. METHODS OF TEACHING COMPUTER SCIENCE **Three credits**

A study of instructional methodology in computer science. Attention is given to characteristic problems faced by teachers.

AREA V — ADVANCED COURSES

EDUCATION 560. PSYCHOLOGY OF EXCEPTIONAL CHILDREN **Three credits**

Advanced study of children whose characteristics deviate significantly from normal children.

Section A — Mentally Retarded
B — Socially and Emotionally Maladjusted
C — Gifted and Talented

EDUCATION 562. REMEDIATION OF LEARNING DISABILITIES I **Three credits**

A study of the major areas of learning disability: gross motor development, sensory-motor development, perceptual-motor skills.

EDUCATION 571. PRACTICUM IN SUPERVISION **Three credits**

Affords students an opportunity to gain experience in supervisory activities in education under the guidance of experienced supervisors.

EDUCATION 573. CURRICULUM CONSTRUCTION **Three credits**

Advanced study of curriculum development and evaluation.

EDUCATION 576. INTRODUCTION TO EDUCATIONAL ADMINISTRATION **Three credits**

Basic study of the administrative function in educational institutions.

EDUCATION 578. SCHOOL LAW **Three credits**

An examination of school law at the federal, state and local levels; review, discussion and analysis of court decisions which affect schools.

EDUCATION 590. THESIS **Three credits**

EDUCATION 594. WORKSHOP **Three credits each semester**

Provides an opportunity for experienced teachers to develop study programs designed to meet their special needs. Students may receive credit more than once if there is no duplication in subject matter covered.

EDUCATION 595-596. INDEPENDENT STUDY **Three credits each semester**

Affords an opportunity for independent study of selected topics under faculty supervision.

Prerequisite: Permission of department chairperson.

EDUCATION 597. SEMINAR **Three credits**

An advanced course dealing with some significant issues selected by the instructor. The seminar technique provides a review of major problems based on the current level of knowledge in the area.

Prerequisite: Permission of the instructor.

EDUCATION 598. TOPICS **Three credits**

Advanced study of topics of special interest not extensively treated in regular courses.

EDUCATION 599. SHORT COURSES **Three credits**

These courses treat a variety of topics, usually on a condensed schedule basis. Designed to investigate problems in the field, these courses provide an opportunity for practicing professionals to study current issues under qualified leadership. Departmental approval is required if credits are to be applied to meet degree requirements. A maximum of six credits may be used to meet degree requirements. Credit is given at the rate of one-half semester hour for each eight hours of classwork.

English

Patricia B. Heaman, (Ph.D.) *Chairperson*

Master of Science in Education

SPECIAL DEGREE REQUIREMENTS

Candidates for the degree of Master of Science in Education with a program in Secondary Education/English must complete eighteen hours of course work in English, twelve of which must be in courses numbered 400 or above.

Information on requirements of the Education Department for the Master of Science Degree will be found under Education on page 34.

COURSES OF INSTRUCTION

ENGLISH 301. LITERARY CRITICISM **Three credits**

A study of literary theory and the techniques of analysis.

ENGLISH 310. MEDIEVAL ENGLISH LITERATURE **Three credits**

A study of English literature to 1500, exclusive of Chaucer.

ENGLISH 312. CHAUCER **Three credits**

Study of Chaucer's works, including *The Canterbury Tales* and *Troilus and Criseyde.*

Prerequisite: Eng 152 or 254.

ENGLISH 320. TUDOR PROSE AND POETRY **Three credits**

Study of English non-dramatic literature from 1485 to 1603.

ENGLISH 321. EARLY ENGLISH DRAMA **Three credits**

Study of the drama from the tenth century to 1642; reading of plays by pre-Elizabethan and Elizabethan dramatists exclusive of Shakespeare.

ENGLISH 325. SHAKESPEARE **Three credits**

A study of selected plays; written reports on others not studied in class.

Prerequisite: Eng 152 or 254.

ENGLISH 330. SEVENTEENTH CENTURY PROSE AND POETRY **Three credits**

A study of the non-dramatic literature of the period.

ENGLISH 335. MILTON **Three credits**

A study of Milton's poetry and major prose.

ENGLISH 341. RESTORATION AND EIGHTEENTH CENTURY DRAMA **Three credits**

Study of the drama from 1660 to 1780.

ENGLISH 343.
EIGHTEENTH CENTURY PROSE AND POETRY **Three credits**

The chief poets and essayists of the eighteenth century. Includes Swift, Pope, and Johnson.

ENGLISH 345. EARLY ENGLISH NOVEL **Three credits**

English prose fiction of the sixteenth and seventeenth centuries; rise of the novel to the close of the eighteenth century.

ENGLISH 354. ROMANTIC PROSE AND POETRY **Three credits**

Study of Blake, Wordsworth, Coleridge, Shelley, Keats, and Byron, with related prose writers of the Romantic Period.

ENGLISH 360. VICTORIAN PROSE AND POETRY **Three credits**

Readings in Tennyson, Browning, Arnold, and other significant writers of the Victorian Age.

ENGLISH 366. LATER ENGLISH NOVEL **Three credits**

The major novelists of the nineteenth and early twentieth centuries.

ENGLISH 370. MODERN BRITISH POETRY **Three credits**

Study of the major English and American poetry of the twentieth century.

ENGLISH 372. MODERN NOVEL **Three credits**

Study of the major English and American novels of the twentieth century.

ENGLISH 374. MODERN DRAMA **Three credits**

Study of important dramatists, European and American, from the time of Ibsen.

ENGLISH 381. AMERICAN LITERATURE I **Three credits**

A study of American literature to the Civil War.

Prerequisite: Eng 152 or 254.

ENGLISH 382. AMERICAN LITERATURE II **Three credits**

A study of American literature from the Civil War to the present time.

Prerequisite: Eng 152 or 254.

ENGLISH 383. AMERICAN NOVEL **Three credits**

A study of the American novel from its beginning to the present.

ENGLISH 384. AMERICAN DRAMA **Three credits**

A study of the American drama from the colonial period to the present.

Prerequisite: Eng 152 or 254.

ENGLISH 386. MODERN AMERICAN POETRY **Three credits**

Study of major movements and representative figures in modern American poetry.

Prerequisite: Eng 152 or 254.

ENGLISH 395-396. INDEPENDENT RESEARCH **One to three credits**

Independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.

Prerequisite: Approval of department chairperson.

ENGLISH 397. SEMINAR (Maximum of three credits per student)
One to three credits

Presentations and discussions of selected topics.

Prerequisite: Approval of department chairperson is required.

ENGLISH 398. TOPICS **Three credits**

A study of special topics in English and American literature.

Prerequisite: Eng 152 or 254.

ENGLISH 400. INTRODUCTION TO RESEARCH **Three credits**

An introductory course in research and bibliography designed to acquaint the graduate student with the resources and procedures used in literary research.

ENGLISH 405. STUDIES IN LINGUISTICS **Three credits**

A study of generative transformational grammar as developed by Chomsky, Lees and others resulting from work done by Harris and other structuralists.

ENGLISH 410. STUDIES IN MEDIEVAL LITERATURE **Three credits**

The study of selected topics in Medieval English literature.

ENGLISH 420. STUDIES IN RENAISSANCE LITERATURE **Three credits**

A study of selected major figures of the English Renaissance.

ENGLISH 440. STUDIES IN RESTORATION AND EIGHTEENTH CENTURY LITERATURE **Three credits**

A study of selected topics in English literature from 1660 to 1800.

ENGLISH 450. STUDIES IN ROMANTIC AND VICTORIAN LITERATURE **Three credits**

A study of selected major English prose and poetry of the nineteenth century.

ENGLISH 470. STUDIES IN MODERN BRITISH LITERATURE **Three credits**

A study of selected major British authors of the twentieth century.

ENGLISH 480. STUDIES IN AMERICAN LITERATURE **Three credits**

A study of selected major movements and figures in American literature from the Puritans to contemporary authors.

ENGLISH 497. SEMINAR IN SPECIAL PROBLEMS **One to three credits**

This course is designed for intensive research in any specific area of English or American literature.

History

Joel Berlatsky, (Ph.D.) *Chairperson*

Master of Science in Education

SPECIAL DEGREE REQUIREMENTS

Candidates for the degree of Master of Science in Education with a program in Secondary Education/History must take eighteen hours of history or twelve hours in history and six hours of political science in courses numbered 300 or above.

Information on requirements of the Education Department for the Master of Science in Education, major in history, will be found under Education on page 34.

COURSES OF INSTRUCTION

HISTORY 315.
READINGS IN ANCIENT HISTORY: THE NEAR EAST **Three credits**

Selected readings on the history of the Ancient Near East, with emphasis on primary sources. Conferences with instructor and paper.

Offered in alternate years.

HISTORY 316.
READINGS IN ANCIENT HISTORY: THE CLASSICAL WORLD **Three credits**

Selected readings on the history of Greece and Rome, with emphasis on primary sources. Conferences with instructor and paper.

Offered in alternate years.

HISTORY 321. AMERICAN SOCIAL HISTORY **Three credits**

This course entails a consideration of the development of American society from the colonial period until present times. Attention will focus especially on the rise of industrialism and its impact on society in the late nineteenth and twentieth centuries.

Offered every third year.

HISTORY 322. AMERICAN INTELLECTUAL HISTORY **Three credits**

This course is a survey of the formative ideas which seem most to have influenced American perceptions of the individual, society, and the drift of human affairs. The focus is upon the late 19th and early 20th centuries because this period is the time when seminal ideas were articulated in America.

Offered every fourth year.

HISTORY 324. AMERICAN ECONOMIC HISTORY **Three credits**

A survey of the evolution of the American economy from colonial dependency to modern industrial maturity. Emphasis will be placed upon the development of the United States as an industrial world power since about 1850.

Offered every third year.

HISTORY 325. AMERICAN ETHNIC HISTORY **Three credits**

A study of the institutions and problems that have characterized various immigrant, black, and Indian communities from colonial times to the present.

Offered every fourth year.

HISTORY 328. HISTORY OF THE
FOREIGN POLICY OF THE UNITED STATES **Three credits**

A selective treatment of major themes in American foreign policy from the founding of the Republic to the present.

Offered in alternative years.

HISTORY 331. COLONIAL AMERICA **Three credits**

Discovery, exploration and settlement; development of social, political, religious and intellectual institutions; independence and political reorganization.

Offered in alternative years.

HISTORY 332. THE NATIONAL PERIOD **Three credits**

A study of the political and economic history of the United States from 1783 to 1865. Special attention will be given to the evolution of sectional differences and the culmination of these differences in intersectional warfare.

Offered in alternative years.

HISTORY 333. THE AGE OF BIG BUSINESS, 1865-1914 **Three credits**

A study of the political and economic history of the United States from 1865 to 1914. Special attention will be paid to the period of congressional dominance and the restoration of presidential power at the turn of the century; the economic, social and political consequences of the industrial revolution; and the rise of urban America.

Offered in alternative years.

HISTORY 334. THE UNITED STATES, 1900-1945 **Three credits**

The emergence of the United States as a world power and the corresponding development of its political, economic, social, and religious institutions.

Offered in alternative years.

HISTORY 341-342. HISTORY OF GREAT BRITAIN AND THE
BRITISH EMPIRE AND COMMONWEALTH **Three credits each semester**

A study of British history from the Neolithic period to present times. The first semester will cover social, economic, and political developments to 1783, including expansion overseas. The second semester will cover the consequences of the industrial revolution and the evolution of the Empire into the Commonwealth.

HISTORY 348. HISTORY OF RUSSIA **Three credits**

A study of the political, social, and intellectual history of Russia. Emphasis is placed upon the emergence of Russia as a major power after 1700.

HISTORY 351. READINGS IN MEDIEVAL EUROPE **Three credits**

Selected readings on the history of Medieval Europe, with emphasis on primary sources. Conferences with instructor and paper.

Offered in alternate years.

HISTORY 352. THE RENAISSANCE AND REFORMATION **Three credits**

Within the political and economic framework of the period, study will be made of the culture of the Renaissance, the religious reform and conflicts resulting from the crisis in the sixteenth century.

HISTORY 353. AGE OF ABSOLUTISM **Three credits**

The political, social, economic, intellectual, and cultural development of Europe and dependencies from 1600 to ca. 1750.

HISTORY 354. THE ERA OF THE
FRENCH REVOLUTION AND NAPOLEON **Three credits**

A study of the structure of the Ancien Regime and an examination of the courses, events, and consequences of the French Revolution culminating in the Napoleonic Empire.

HISTORY 355. EUROPE IN THE NINETEENTH CENTURY **Three credits**

A study of the political, social, and cultural development of Europe from the Congress of Vienna to World War I.

HISTORY 356. EUROPE IN THE TWENTIETH CENTURY **Three credits**

Against a background of the internal and international developments of the leading powers, the class will study the origins and results of the two World Wars.

HISTORY 361-362.
HISTORY OF THE FAR EAST **Three credits each semester**

A study of the history of the civilizations developed in India, China, and Japan with emphasis on their interrelations and distinctive characteristics and on their transformation in response to the penetration of western civilization from the sixteenth century onward. Some attention will be given to similar developments and changes among the countries of Southeast Asia. Fall semester: to c. 1760. Spring semester: 1760 to present.

HISTORY 363. HISTORY OF MODERN CHINA **Three credits**
A study of Chinese history since 1840 with special emphasis on social, political, economic, and intellectual developments.

HISTORY 364. DIPLOMATIC HISTORY OF THE FAR EAST **Three credits**
A study of the relationship of the states of the Far East with one another and the West in the nineteenth and twentieth centuries.

HISTORY 365. HISTORY OF CHINESE COMMUNISM **Three credits**
This course is designed to examine the origins of Chinese Communism, the rise of the Chinese Communist Party to national power, and the essential features of Mao Tse-tung's strategies and policies.

HISTORY 367. MODERN SOUTH ASIA **Three credits**
A study of the political, social, and economic development of the Indian sub-continent since 1500.

HISTORY 376. WORLD WAR II **Three credits**
Consideration of the causes of the war, military strategy and tactics, diplomatic interests of the participants, and resulting cold war problems.

HISTORY 391. HISTORIOGRAPHY AND RESEARCH **Three credits**
An introduction to historical research and writing. The writings and ideas of major historians of the past and present are examined. The student is exposed to research methods, particularly in the area of primary sources, and to the construction and criticism of the historical monograph.

HISTORY 395-396. INDEPENDENT RESEARCH **One to three credits**
Independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.

HISTORY 398. TOPICS **Three credits**
Special topics in history. This course will be offered from time to time when interest and demand justify it.

HISTORY 497. SEMINAR **One to three credits**
Presentations and discussions of selected topics. (May be repeated for credit.)
Prerequisite: Approval of the instructor is required.

Nursing

Ann M. Kolanowski, (M.S., Ph.D.) *Chairperson*
Sharon Telban, (M.S.) *Program Director*

Master of Science with Major in Nursing

The purposes of the graduate program in Nursing at Wilkes University include preparation of an advanced practitioner in nursing who can focus upon the complex needs of clients in a variety of settings and functional role development in nursing administration, education, or clinical practice. This program will provide a foundation for doctoral study in nursing and for continued professional development.

Implementing the philosophy of the Department of Nursing, the program is consistent with the mission of the college which includes service to Northeastern Pennsylvania. The first clinical focus is, therefore, upon advanced practice in gerontological nursing. Functional preparation

may be selected from the areas of administration, education or clinical practice.

Multidisciplinary in approach, the program encourages individual choice based upon the personal interests and career goals of the student. Flexible scheduling of courses enhances the ability of students to complete program requirements while maintaining employment or in full-time study.

ADMISSION REQUIREMENTS

In addition to the requirements of the Division of Graduate Studies, admission to the graduate program in nursing requires:

1. Graduation of an approved baccalaureate program in nursing.
2. Licensure as a Registered Nurse in Pennsylvania.
3. One year of clinical experience.
4. An undergraduate statistics course.
5. An undergraduate research course.
6. Evidence of health assessment skills.
7. Scores on the Graduate Record Examinations (GRE) **or** the Miller Analogies Test.
8. A statement of professional goals. These goals should relate to the goals of the graduate program in nursing at Wilkes.

A student whose background is judged to be deficient in any area will be evaluated individually and a program plan which will remedy the deficiency will be developed. Courses to remedy such deficiency do not carry graduate credits.

For a personal interview to discuss program requirements and career goals, please arrange an appointment with the Program Director.

For further information specifically related to the nursing program, write or call:

Director Graduate Program in Nursing
Wilkes University
Wilkes-Barre, PA 18766
Phone (717) 824-4651
ext. 4076

or

Chairperson Department of Nursing
Wilkes University
Wilkes-Barre, PA 18766
ext. 4074

(See last page of the bulletin for toll-free numbers)

PHILOSOPHY

The Department of Nursing, consistent with the mission of the University, has as its responsibility the provision of sound and stimulating experiences for students and a program of service to the community. Building upon solid undergraduate preparation, the graduate program in nursing is designed to prepare students to deal intelligently with the complexities of a rapidly changing society; to examine broader conceptualizations of

the body of nursing knowledge; to develop specialized clinical expertise with select populations reflective of demographic characteristics of Northeastern Pennsylvania; and, to integrate leadership skills into their professional roles.

The Graduate Program in Nursing implements the philosophy of the Department of Nursing which identifies the individual, society, health, and nursing as the major structural components of the undergraduate curriculum. The graduate faculty believe that graduate education in nursing flows from expectations consistent with a known level of prior learning and development. Study at the graduate level assists students to synthesize knowledge from the humanities, physical and social sciences, and nursing with a greater capacity for its application to practice. Based on sound nursing theory, functional preparation will provide students with advanced clinical knowledge which will enable them to assume leadership positions in nursing administration, education, and practice.

Having demonstrated commitment to nursing as a career, the graduate student selects an area based upon personal interests and professional goals. Consistent with the mission of the University, this program is multidisciplinary in its approach and encourages individual choice. The faculty believes that, as a self-directed and active learner, the student is a partner in the teaching-learning enterprise. Flexibility within the program permits student selection of elective and support courses which enable achievement of goals, utilization of abilities, and fulfillment of individual, professional needs. The student interacts with faculty to expand knowledge, to articulate ideas, and to engage in scholarly pursuits which serve as a basis for doctoral study in nursing.

THE PROGRAM OBJECTIVES

The Master of Science Program with a major in Nursing is designed to prepare graduates to:

1. Address the complex needs of a selected population.
2. Synthesize knowledge of nursing within the context of related sciences and humanities as a basis of leadership roles in the profession.
3. Expand nursing practice through study of leadership role development.
4. Assume a leadership position in nursing administration, education, or clinical practice.
5. Analyze and extend nursing knowledge and practice through nursing research.
6. Construct a functional role which exemplifies a positive attitude toward the profession of nursing.
7. Evaluate current issues in nursing from the perspective of nursing theory and research findings.

8. Develop commitment to life-long learning as a part of professional nursing practice.

THE CURRICULUM
(36 Credits)

THE CORE (fifteen credits)

N501. Theoretical Foundation of Nursing	3 credits
N503. Application of Nursing Research	3 credits
N505. Current Perspectives in Nursing	3 credits
HSA553. Leadership Skills and Executive Development for Health Professionals	3 credits
N590. Scholarly Project	3 credits

THE CLINICAL FOCUS (nine credits)

N511/HSA 561. Perspectives on Aging	3 credits
N504. *The Gerontic Nurse	3 credits
N506. Application of a Formal Model to Nursing Practice	3 credits

THE FUNCTIONAL AREA (six credits)

Each student is required to complete one six-credit practicum sequence in their chosen area.

Administration of Nursing Service:

N513. Practicum in Nursing Administration	3 credits
N598. *The Nurse Administrator	3 credits

Education in Nursing:

N514. Practicum in Nursing Education	3 credits
ED598. *Curriculum Development for Nursing	3 credits

Clinical Practice:

N515. Advanced Practicum in Nursing Care of the Elderly	3 credits
N598. *Strategies in Nursing Care of the Older Adult	3 credits

**Examples of courses which support the functional practicum.*

ELECTIVE/SUPPORT COURSES (six credits)

In consultation with the advisor, the graduate student may choose from graduate courses available in **any** program of the University. Careful attention to prerequisites must be given. Examples of such courses include:

COURSES OF INSTRUCTION

NURSING 501. THEORETICAL FOUNDATIONS OF NURSING **Three credits**

This course emphasizes the systematic process of concept and theory development. Students will analyze current theories of nursing, related nursing research, and their interrelationship with selected theories from the natural, behavioral and applied health sciences.

Prerequisite: Graduate Standing.

NURSING 503. APPLICATION OF NURSING RESEARCH **Three credits**

Students will explore the application of the research process to nursing practice. Selected research designs and methods by which scientific knowledge in nursing is developed are examined. Skills basic to the analysis and evaluation of nursing research are developed. Further elaboration of the plan and design of research is implemented through proposal development.

Prerequisite: Undergraduate Statistics.

NURSING 505. CURRENT PERSPECTIVES IN NURSING **Three credits**

The student analyzes issues relative to advanced professional practice in nursing. Proposed approaches to the resolution of problems, and the delineation of trends are explored in a seminar format.

Prerequisite: Graduate Standing.

NURSING 590. SCHOLARLY PROJECT **Three credits**

Each student must complete a scholarly project prior to graduation. There is one semester time constraint for the completion of the project and its associated paper. This may be carried out in conjunction with any nursing course in the program.

The student, under the guidance of a selected faculty member, will critique and synthesize relevant research and literature in a concept or theory germane to nursing. The student will explore interrelationships between ideas in a manner which reflects individual thinking. Implications for practice, education or administration will be addressed. The student will defend his/her position in an oral examination arranged by the graduate secretary.

Prerequisite: NSG 501, 503, 506 and consent of instructor.

NURSING 511/HSA 561. PERSPECTIVES ON AGING **Three credits**

Human development from adulthood through old age is analyzed. Main focus is upon social and emotional changes associated with various states of later adult life. The specific relationships between the graying of America, the subsequent development of chronic diseases and alternate health care delivery systems for the elderly will be discussed in detail.

Emphasis throughout the course will be on the older adult. Physiological development and the differentiation between normal age changes and disease states will be explored.

Prerequisite: Graduate Standing.

NURSING 504. THE GERONTIC NURSE **Three credits**

Role development as a clinical nurse specialist will be explored. Direct and indirect caring approaches to gerontologic nursing will be included. Discussions will involve roll theory, principles of leadership, and their interaction with a selected aging population.

Prerequisite: NSG 511.

NURSING 506. APPLICATION OF A FORMAL MODEL TO NURSING PRACTICE **Three credits**

Students select a model of practice for application in the restoration, promotion, or maintenance of wellness in the older adult community. Clinical experiences provide the opportunity to implement the selected model.

The seminar component of the course is designed to facilitate synthesis of concepts of model development, professionalization, and nursing within a selected population.

Prerequisites: NSG 501 and 511.
RN licensure.

FUNCTIONAL AREA COURSES

NURSING 513/514/515: PRACTICUM COURSES **Three credits**

Each student will select one practicum and a course which supports its activity with appropriate content areas. The practicum provides an opportunity for students to select and operationalize an aspect of a professional role in nursing. The purpose of the course is to permit students to analyze the multiple dimensions of this role, to develop strategies to enhance an area of practice, and to participate actively in a selected setting.

NURSING 595: INDEPENDENT STUDY **One to Three credits**

Affords an opportunity for independent study of selected topics under faculty supervision.

Prerequisite: Permission of department chairperson or program director.

NURSING 598: TOPICS IN NURSING **Three credits**

Advanced study of topics of special interest not extensively treated in regular courses.

Prerequisite: Graduate Standing.

School of Business, Society and Public Policy

Theodore J. Engel, (M.B.A., M.A.) *Dean*
Ashim K. Basu, (Ph.D.) *Associate Dean and Chairperson of the Health Services Administration Department*
Dr. Merle J. Peper, (Ph.D.) *Associate Dean and Chairperson of the Business Administration Department*
Cynthia J. Chisarick, (M.B.A., C.P.A.) *Chairperson of the Accounting Department*
Wagiha A. Taylor, (Ph.D.) *M.B.A. Coordinator*

Programs

Master of Business Administration (MBA)

The curriculum leading to the Master of Business Administration Degree provides an opportunity for specialization in a selected field but is concerned mainly with advanced study of broad managerial concepts and relationships. The purposes are:

1. To develop professional managers, with emphasis on the foundation, organization, operation, and control of an enterprise;
2. To develop individuals trained in research and constructive leadership;
3. To enable individuals to create and evaluate alternative courses of action as a procedure for making decisions.

The program is designed to provide management education at the master's level not only for those who have had undergraduate training in business and economics, but also for interested engineers, scientists, and others who have a minimum amount of background education in this area.

Each student upon admission to the program will be assigned an advisor to guide him in the program.

ADMISSION

A candidate for the M.B.A. degree who is a graduate of an approved college or university and who has had basic courses in accounting, business law, managerial finance, economics, marketing, money and banking, computer programming, and statistics will probably have an adequate background to complete the requirements or a degree in two years.

Admission to the program is dependent upon a satisfactory performance on the Graduate Management Admission Test (GMAT). Test results should accompany the application to the program.

Background Undergraduate Course Requirements for Candidates in Master of Business Administration Program:

Accounting	1 year	Managerial Finance	1 semester
Business Law	1 semester	Money and Banking	1 semester
Economics	1 year (Principles)	Marketing Principles	1 semester
Statistics	1 semester	Computer Science	1 semester

If a student has not taken one of the above courses in the common professional component (CPC), but believes that he possesses the information normally taught in that courses, he may request a challenge examination. Interested students should contact the department chairman. A fee of $20 per credit will be assessed for each challenge examination. Students requesting a challenge examination must present a receipt from the Finance Office before the examination will be administered.

The grade of D or D+ in any of the CPC undergraduate courses will not be accepted. It is advisable that the student should start with the background undergraduate courses, then take the core courses and proceed to the electives.

DEGREE REQUIREMENTS

All candidates for the Master of Business Administration Degree must complete a total of **thirty-three** credits of graduate work in 500-level courses. Eighteen of these thirty-three credits must be in core courses. All candidates must complete Accounting 501 or an advanced Accounting course; Business Administration 502; Business Administration 504; Business Administration 507; Economics 505; and Economics 510. (Students with a minimum preparation in Accounting are urged to take Accounting 501; students with twelve or more credits earned in Accounting will not be admitted to Accounting 503, but must substitute Accounting 561, 562, 563, 564, 565 or 566.) The other fifteen of the thirty-three credits must be drawn from one or more areas of specialization. At least six credits must be in one concentration. The remaining nine credits may be allocated among the concentrations in any fashion.

A graduate student in Business Administration is required to pass a written comprehensive examination covering the broad field of business administration. This examination is given during the spring and fall semesters. The fee for the examination is $25.00. The comprehensive exam registration form is available at the Graduate Office. A student who fails the comprehensive examination may retake it only once.

Business Administration

COURSES OF INSTRUCTION

CORE COURSES (18 semester hours required)

ACC 501. FINANCIAL AND MANAGERIAL ACCOUNTING **Three credits**

A basic understanding of both internal and external accounting principles and techniques with appropriate application to decision models. Financial and managerial accounting concepts and issues are considered from the viewpoint of the report user.

Undergraduate Requirements: 2 semesters of Accounting Principles,
1 semester of Managerial Finance.

Students with 12 credit hours or more of accounting must fulfill the accounting core requirement by taking one of the following: Acc 561, Acc 562, Acc 563, Acc 564, Acc 565 or Acc 566. (No independent research.)

BUSINESS ADMINISTRATION 502. MANAGEMENT SCIENCE **Three credits**

As an introductory survey of quantitative decision-making techniques and appropriate applications from the perspective of the user-client. Emphasis is upon the construction of optimization and decision models and the development of efficient solution algorithms.

Undergraduate Requirements: Computer Science.

BUSINESS ADMINISTRATION 504. STRATEGIC MANAGEMENT **Three credits**

A course which examines how an organization deals with the constraints and complexities of the real world in its strategic decision making. It establishes models for formulating, implementing, and evaluating strategy and policy.

BUSINESS ADMINISTRATION 507. BUSINESS AND SOCIETY **Three credits**

This course deals with the problems of the responsible business manager in a private enterprise society, particularly those problems dealing with policy-making and administration when both economic and non-economic factors are involved. Questions are raised as to the kinds of responsibility and the extent of responsibility business managers have to the goals of our society, to the communities in which they operate, to the people they employ, and to governmental policies, as well as to the stockholders of their own firms.

Undergraduate Requirements: Business Law.

ECONOMICS 505. MANAGERIAL STATISTICS **Three credits**

An introductory graduate course in techniques, limits, and areas of application of statistical techniques.

Undergraduate Requirements: Statistics.

ECONOMICS 510. MANAGERIAL ECONOMICS **Three credits**

Problems of the firm. Price and output determination with analysis of cost and demand functions in markets of various types and under various conditions of business. The course will deal with the application of economic theory to business practice.

Requirements: 2 semesters of Economics, BA 502, Ec 505.

The formal policy of The School of Business and Economics is that all core courses must be taken in the traditional fashion. They may not be taken on an independent study basis.

AREA I — MARKETING SPECIALIZATIONS

BUSINESS ADMINISTRATION 511.
MODERN INTERNATIONAL COMMERCE **Three credits**

This course is designed to introduce the student to the practical principles and methods of international marketing. Subjects covered will include the development and management of exports and imports, channels of trade, the mechanics of international finance, foreign credits, technical procedures and documentation.

BUSINESS ADMINISTRATION 512.
PRICE POLICY AND PROCEDURE **Three credits**

This course describes the basic pricing process, relates it to pricing decisions, and attempts to provide a systematic pricing program for managers to follow. Topics covered will include internal and external factors in pricing decisions, pricing models in various kinds of market structure, the special problems of manufacturers and distributors, as well as the management of resources used in the production process and hiring decisions.

Prerequisite: Microeconomics, Macroeconomics.

BUSINESS ADMINISTRATION 513.
HUMAN BEHAVIOR AND THE MARKETING PROCESS **Three credits**

Analyzes the fundamental concepts and ecology of human behavior which impact upon consumer decision making and marketing strategies. Cognitive variables, consumer characteristics and environmental variables are explored and marketing implications are developed.

Prerequisite: Marketing Principles.

BUSINESS ADMINISTRATION 514.
MARKET RESEARCH AND EXPERIMENTATION **Three credits**

Examines the principles and techniques of scientific market research (problem definition, research design, sampling, questionnaire development, data collection and analysis, interpretation, and evaluation.) Developes research process skills through student designed and implanted research projects.

Prerequisite: Marketing Principles, EC 505.

BUSINESS ADMINISTRATION 515.
MARKETING MANAGEMENT SEMINAR **Three credits**

This seminar deals with the planning, organizing, directing, and controlling of resource utilization as it applies to the marketing function. Students share responsibility for asimilating and presenting material for discussion.

Prerequisite: Microeconomics, Macroeconomics, Marketing Principles.

BUSINESS ADMINISTRATION 516.
MARKETING SIMULATIONS **Three credits**

This is a course in "marketing game-playing". Class time is divided between lectures on marketing strategy and participation in a marketing game. Students work in groups as "companies" and make decisions relative to production levels, promotion techniques, distribution systems, product features, and pricing policies.

Prerequisite: Microeconomics, Macroeconomics, Marketing Principles.

AREA II — MANAGERIAL SCIENCE

BUSINESS ADMINISTRATION 521.
ORGANIZATIONAL THEORY **Three credits**

This course utilizes the "case analysis" approach in dealing with the theories of organizational structures as they apply to planning utilization of resources, employee motivation, and strategy development.

Prerequisite: Acc 501.

BUSINESS ADMINISTRATION 522.
QUANTITATIVE ASPECTS OF MANAGEMENT **Three credits**

This course examines the quantitative aspects of management. It analyzes the optimization of management decisions in the operation of the firm.

Prerequisite: BA 502 or permission of instructor.

BUSINESS ADMINISTRATION 523.
MANAGEMENT SEMINAR I **Three credits**

This seminar brings to bear current management techniques on a variety of problems. Students will be guided in theoretical readings and will apply their knowledge in seminar discussions.

BUSINESS ADMINISTRATION 524.
MANAGEMENT SEMINAR **Three credits**

This seminar has a research orientation. Research, objectives, techniques and methodology will be dealt with.

BUSINESS ADMINISTRATION 525.
HUMAN RESOURCE MANAGEMENT **Three credits**

A survey of the activities and decision-making functions of the human resources manager, including manpower planning, employee rights, EEOC dealings, training and development, employee evaluation techniques, compensation packages, and recruitment of personnel.

AREA III — LABOR

ECONOMICS 506. LABOR-MANAGEMENT ECONOMICS **Three credits**

A course dealing with issues and trends in collective bargaining and industrial relations today. The shifting roles and relationships of labor-management and government will be dealt with. Problems of maintaining the labor force and the social aspects of industry will be dealt with.

Prerequisite: Microeconomics and Macroeconomics.

ECONOMICS 533. THE LABOR MARKET **Three credits**

Economic and non-economic forces influencing labor supply and demand will be studied. Determinants of the labor force, unemployment, labor mobility, and the functioning of the labor market will be investigated.

ECONOMICS 534. LABOR SEMINAR **Three credits**

This seminar deals with current issues and theoretical concepts in industrial relations.

AREA IV — ACCOUNTING

ACCOUNTING 561. CORPORATE FINANCIAL REPORTING **Three credits**

The study of corporate reporting practices and principles in contemporary accounting. Special attention is given to the authoritative pronouncements of the Financial Accounting Standards Board and the Securities and Exchange Commission.

Prerequisite: 12 credit hours of accounting.

ACCOUNTING 562. FINANCIAL AND TAX PLANNING **Three credits**

Analysis of federal tax regulations and interpretations. Stress will be placed upon the timing of business transactions and the tax implications in choosing financial alternatives.

Prerequisite: 12 credit hours of accounting.

ACCOUNTING 563. ACCOUNTING POLICIES AND PRACTICES **Three credits**

A review of generally accepted auditing standards and the theories supporting them. Includes application of auditing techniques and the legal liabilities of the auditor. In addition, the role of the internal auditor, with an emphasis on the objectives, organization, and operation of the internal audit in the private sector, will be examined.

Prerequisite: 12 credit hours of accounting.

ACCOUNTING 564. EVOLUTION OF ACCOUNTING THOUGHT **Three credits**

A comprehensive review of the way in which accounting policies, practices, and ideas have developed over time.

Prerequisite: 12 credit hours of accounting.

ACCOUNTING 565. PROFESSIONAL SEMINAR **Three credits**

Discussion of current accounting research, literature and theory, consideration of the role of the accountant in management advisory services.

Prerequisite: 12 credit hours of accounting.

ACCOUNTING 566. ACCOUNTING INFORMATION SYSTEMS **Three credits**

An examination of the systems employed to process and sort business events so as to provide the functions of financial reporting, internal responsibility accounting, decision support, internal control, and modeling.

Prerequisite: 12 credit hours of accounting.

AREA V — FINANCE

BUSINESS ADMINISTRATION 551.
INVESTMENT AND PORTFOLIO MANAGEMENT **Three credits**

An examination of the methods of security analysis and market timing for both speculative and investment-quality instruments. Focus is upon traditional techniques of portfolio management, as well as Modern Portfolio Theory.

Prerequisite: Investment principles or permission of instructor.

BUSINESS ADMINISTRATION 552.
FINANCIAL MANAGEMENT **Three credits**

An investigation into the theories and techniques of financial planning and analysis. Working capital management and cash budgeting are given special attention. Also emphasized are capital budgeting issues, such as capital asset acquisition, capital structure considerations, and the evaluation of financing options.

Prerequisite: Principles of Finance.

BUSINESS ADMINISTRATION 553.
THE BEHAVIOR OF FINANCIAL MARKETS AND INSTITUTIONS **Three credits**

An analysis of the structural relationships between and among financial enterprises, including the role of government regulators. Focus is upon the dynamics of the funds allocation process and the decision-making procedures of financial managers.

BUSINESS ADMINISTRATION 554.
MANAGERIAL FINANCE SEMINAR **Three credits**

Problems in managerial finance. Special topics.

BUSINESS ADMINISTRATION 557.
PENSION ADMINISTRATION **Three credits**

The problem of the superannuated employee is central. Social Security is viewed as underlying the solution of the problem. Defined benefit and defined contribution plans arising from employer responsibility are stressed.

BUSINESS ADMINISTRATION 558.
RISK MANAGEMENT AND INSURANCE **Three credits**

A study of the principles of risk management and insurance applied to the needs of individuals and organizations. Course content includes the tools of risk management, types of insurance contracts, insurer operations, and analysis of public policy issues associated with risk management and insurance.

AREA VI — INTERNATIONAL BUSINESS MANAGEMENT

BUSINESS ADMINISTRATION 511.
MODERN INTERNATIONAL COMMERCE **Three credits**

This course is designed to introduce the student to the practical principles and methods of international marketing. Subjects covered will include the development and management of exports and imports, channels of trade, the mechanics of international finance, foreign credits, technical procedures and documentation.

BUSINESS ADMINISTRATION 571.
CROSS-CULTURAL ANALYSIS AND PERSPECTIVE **Three credits**

This course uses an anthropological perspective in the examination of international business culture. The course demonstrates how viewing international business in its cultural context can improve American business persons as trading partners, increase American competitiveness and enhance our confidence and enjoyment as participants in the international marketplace.

BUSINESS ADMINISTRATION 572.
THEORIES OF THE MULTINATIONAL ENTERPRISE **Three credits**

This course critically appraises the main economic and behavioral theories of Foreign Direct Investment, International Production and the Multinational Enterprise.

BUSINESS ADMINISTRATION 573.
INTERNATIONAL BUSINESS MANAGEMENT **Three credits**

This is an integrative capstone course utilizing a system perspective to analyze complex organizational issues and problems from the view point of the international business firm. Cases and written reports are used extensively.

Prerequisites: Students need a background in the following areas in order to be properly prepared to handle the course material: Acc 501, Financial and Managerial Accounting; BA 502, Management Science; BA 504, Strategic Management; Ec 505, Managerial Statistics; and Ec 510, Management Economics.

AREA VII — HEALTH CARE

The Health Care concentration requires nine credits in Health Care designated courses. A maximum of nine credits in Health Care designated courses may count toward the satisfaction of the MBA degree requirements. Prior faculty advisor approval is required for all courses in the concentration.

Please see the section on Health Administration, pages 61 through 66 for description of Health Care courses.

SPECIAL COURSES

ACCOUNTING 550. TOPICS **Three credits**

Special topics in accounting. This course will be offered from time to time as interest and demand justify it.

ACCOUNTING 595. INDEPENDENT RESEARCH **Three credits**

Independent study and research for advanced students in the field of the major under the direction of a staff member.

BUSINESS ADMINISTRATION 508. MANAGEMENT INFORMATION SYSTEMS (See Computer Science 408) **Three credits**

The theory and application of the assumption that an organization can be viewed as an information network. Analyzes the flow of information with an organization. Explores the impact of information processing requirements on organizational design and management.

Prerequisite: Admission to the MBA program or permission of The School of Business, Society and Public Policy or the Department of Mathematics and Computer Science. No computer programming background is assumed.

BUSINESS ADMINISTRATION 550. TOPICS **Three credits**

Special topics in business administration. This course will be offered from time to time as interest and demand justify it.

BUSINESS ADMINISTRATION 595.
INDEPENDENT RESEARCH **Three credits**

Independent study and research for advanced students in the field of the major under the direction of a staff member.

ECONOMICS 550. TOPICS **Three credits**

Special topics in economics. This course will be offered from time to time as interest and demand justify it.

ECONOMICS 595. INDEPENDENT STUDY **Three credits**

Independent study and research for advanced students in the field of the major under the direction of a staff member.

Health Administration

Ashim K. Basu, (Ph.D.) *Chairperson of the Health Services Administration Department and Professor of Health Administration*

Master of Health Administration (MHA)

PURPOSE

The graduate program in Health Administration offers graduate work leading to the Masters of Health Administration (M.H.A.) degree. The program prepares students to assume entry to senior level management positions in various health care institutions. The purpose of the program is to educate and train professional administrators who will be able to provide creative leadership in managing various health services organizations and programs. Another function of the program is to act as a resource center for providing assistance to community organizations and to conduct health management and policy research in Northeast Pennsylvania. Specifically, the objectives of the programs are:

1. To develop innovative health care managers skilled in risk-taking, negotiation, team management, organizational leadership and the art of managing change in a shifting health care environment;
2. To develop individuals with analytical skills in health care policy issues, problem solving and sophisticated decision-making techniques, and;
3. To prepare professional managers who are not only able to fuse the traditional mission of health care organization with the emerging business ethic, but are also concerned with issues of access, quality care, social responsibility, and distributive justice in health related matters.

The M.H.A. program provides opportunities for professionals with diverse backgrounds who are already employed in the health care industry to obtain a graduate degree while working full time. The program is also geared to health professionals who seek mid-career retraining, upgrading of health management skills, as well as individuals in a career change. Graduate classes are conveniently scheduled to accommodate the needs of full-time and working students.

ADMISSION REQUIREMENTS

Applications are invited from individuals who have earned undergraduate or graduate degrees in any discipline or field of study. To be considered for admission in the Health Administration Program, the applicant must meet the following minimum requirements:

1. Submit to the Graduate Office a completed graduate application for admission with a payment of a $25.00 application fee;

2. Have a GPA of 2.5 or better on a 4.0 scale for undergraduate coursework or a minimum cumulative graduate GPA of 3.0 for nine or more hours of graduate credit;
3. Submit two letters of professional recommendation from previous academic faculty and/or from current or previous supervisors, if employed. Letters of recommendation should attest the student's fitness for managerial leadership and discuss interpersonal and organizational skills;
4. Submit a professional career goal statement. The goal statement should contain the following information: a) What are your basic skills? b) How have you acquired these skills? c) Which skills are you planning to improve? d) What do you hope to achieve and do with the M.H.A. degree? What kind of management/policy position and/or promotion will you be seeking upon graduation?
5. Have completed one semester college-level coursework in accounting, microeconomics and statistics with a grade "B" or better. Students lacking these prerequisite courses will be provisionally admitted in the program. If the prerequisite courses have not been completed prior to admission, they must be completed during the first calendar year or before 12 credit hours of study in the M.H.A. program are completed, whichever comes first. These requirements may be met by completing the courses at any accredited college or university or may be taken in the School of Business, Society and Public Policy at Wilkes. Credit hours earned in prerequisite courses cannot be applied toward the 39 semester hours required to qualify for the M.H.A. degree;
6. Present evidence of personal achievement, intellectual ability and professional promise through the application process and/or a personal interview with the Graduate Dean and the M.H.A. Chairperson or faculty.

DEGREE REQUIREMENTS

Thirty-nine (39) credit hours are required for the M.H.A. These consist of twenty-seven (27) credits in CORE courses and twelve (12) hours in elective courses. As part of an individualized study plan, students select elective courses which are geared toward a concentration or area of interest. Students will consult with their advisor to develop a menu of possible elective courses from which students may choose their twelve (12) hours of elective courses. However, a minimum of six (6) hours of elective courses must be completed in Health Administration Program.

To complete the requirements for the M.H.A., all degree candidates must fulfill the following two requirements:

(1) Exit requirements.

Students must successfully complete all the exit requirements to acquire an M.H.A. degree. The degree will not be awarded

to any student who fails any part of the exit requirements. A student who fails any part of the exit requirements may retake it only once. The exit requirements consist of the following:

(a) The written comprehensive exam is a six-hour exam consisting of a three-hour general exam and a three-hour exam in the student's area of specialization/interest. At least 33 credit hours must be completed before taking the comprehensive examination. The comprehensive examination is given during the Spring Semester.

(b) A 15-20 minute oral presentation following the written comprehensive examination. This presentation must be from an approved list of presentation topics or other topics approved by the faculty through the H.S.A. Program Director. The presentation should demonstrate proficiency at addressing a problem while showing professional self-understanding, sources of judgement, and patterns of reasoning. After the presentation, the H.S.A. faculty committee will engage in a constructive dialogue regarding the content of the presentation.

(c) Within 10 days before the written comprehensive exam, the candidate will submit one example of a written paper that has been completed as part of required course work in the program. The submitted paper should demonstrate the candidate's ability to think originally, analyze information and data, and communicate ideas clearly.

(2) A minimum grade point average of 3.0 with a single grade of 2.0 being allowed. Any student whose grade point average falls below 3.0 should report to the student's advisor for assistance.

THE CORE (27 hours)

The M.H.A. CORE is interdisciplinary in nature, encompassing health administration and planning, economics and finance, leadership development, and quantitative methods. The CORE consists of the following courses:

HSA 551. Health Policy and Politics
HSA 552. Organizational Theory and Behavior in Health Administration
HSA 553. Leadership Skills and Executive Development for Health Professionals
HSA 554. Medical Sociology
HSA 555. Financial Management in Health Care Organizations
HSA 556. Quantitative and Applied Methods in Health Administration
HSA 557. Strategic Planning and Marketing in Health Care Institutions
HSA 558. Health Economics
HSA 599. Health Administration Colloquium: Capstone Course

SPECIAL CHARACTERISTICS OF THE M.H.A. PROGRAM AT WILKES

The Health Administration Program at Wilkes practices intensive self-directed student advising. Once a student has been accepted by the program, the student is immediately assigned an advisor. Advising sessions are used as an opportunity to communicate effective managerial role models, changing job market conditions, student career ambitions and strengths, and identifying course scheduling options. The key focus of the advising process is to encourage students to move from their strength of present competence to a responsible and rewarding career in health care management.

Most graduate courses are taught in a seminar format. Throughout the core and electives, faculty members expose students to innovative approaches to problem-solving by using various teaching methodologies, including case methods, simulations, mock hearings, field research, group assignments, individual projects, community-expert panels, and student designed independent study. Small classes ensure active student participation and professional interchange among various health professionals. Faculty members in seminars encourage students to develop team building skills that are so important to modern health care management as it confronts the problems of meeting increasing responsibilities with declining financial and organizational resources. Wilkes has an excellent microcomputer laboratory where students acquire hands-on computer experience.

The HSA program benefits from an ongoing relationship of mutual support and interest with the Northeast Pennsylvania health community. As part of this commitment, community health care leaders are actively involved as instructors, guest speakers, and preceptors in the educational process of the M.H.A. students.

CORE COURSES (27 credits required)

HSA 551. HEALTH POLICY AND POLITICS **Three credits**

The health care industry is becoming the largest segment of the American economy. This course focuses on the political process and policy approaches to health care issues since the New Deal. The course focuses particularly on processes through which public policies affecting health are generated and promoted or opposed, adopted or rejected, implemented or evaluated. Phases of the policy process will be analyzed and distinctions drawn between public and private policymaking, and alternative analytic models of the policy process will be examined for their plausibility and utility. Among the topics explored are interest group activities, governmental financing, control processes, mass-elite confrontations, competition of rival ideologies, partisan appeals for electoral support, struggle to win control over governmental decision-making, and the general problems of policy implementation in a system characterized by changing inter-governmental relations.

Offered every fall.

HSA 552. ORGANIZATIONAL THEORY AND BEHAVIOR IN HEALTH CARE INSTITUTIONS **Three credits**

This course examines relevant theories of management and the behavioral sciences as they relate to effective administration of health care institutions. The course deals with the broader question of institutional effectiveness: Can health services organizations become more efficient and effective systems through proper management? Throughout the course this question is addressed by discussing important issues, such as the role of the health manager in motivating and leading work groups; organizational design; change and innovation; communication and coordination, organizational performance, conflict and integration, and adaptation to the external environment. In this course health care organization is perceived as an open system which requires constant interaction with the external environment.

Offered every fall.

HSA 553. LEADERSHIP SKILLS AND EXECUTIVE DEVELOPMENT FOR HEALTH CARE PROFESSIONALS **Three credits**

The course focuses on two central issues: (a) what makes a person an effective leader in health care organizations, and (b) how does a leader translate intention into reality, communicate those intentions successfully, empower others, and know when and how to stay on course and when to change. Examines leadership theories and its application for the health care executive. Emphasizes how to become an innovative leader by achieving mastery over the noisy, incessant, and changing health care environment, rather than simply reacting and living in a perpetual state of shock. Among the leadership skills covered in the course include team-building, vision, empowerment, organizational learning, negotiation, effective communication and alignment, persistence, consistency and focus, creative thinking, sharing of knowledge without letting intentions become orders, openness to influence from those who question the most basic truths, inspire others to make commitment, manage change, and transform doubts into a common purpose.

Prerequisite: HSA 552, or permission of instructor.
Offered every spring.

HSA 554. MEDICAL SOCIOLOGY **Three credits**

Develops critical understanding of the health care systems as it relates to its historical and cross-cultural dimensions, as well as to microsocial and macrosocial levels of analysis. Topics include the development of the medical profession, theories of disease, illness behavior, the stress process, access to care, the medical division of labor, the health care delivery system in its political-economic context, and comparisons to other modern health care delivery systems.

Offered every summer.

HSA 555. FINANCIAL MANAGEMENT IN HEALTH CARE ORGANIZATIONS **Three credits**

Provides an understanding of the primary facets of health care financial management. Includes such topics as institutional fiscal policies, accounting concepts and practices, reimbursement theory, financial statistical reporting, cost containment, and the use of financial data as management tools.

Prerequisite: Undergraduate Accounting.
Offered every fall.

HSA 556. QUANTITATIVE AND APPLIED METHODS IN HEALTH ADMINISTRATION **Three credits**

This course is designed to enable health professionals to apply basic descriptive and inferential statistics to problems within their fields and to provide techniques of critical reading of the health care literature. Topics will include designing a study, data collection and display, testing of hypotheses and evaluating the significance of results. Extensive use will be made of statistical packages, graphics programs, spread sheets and data base management programs for micro and mainframe computers. Programming ability is not assumed.

Prerequisite: Undergraduate Statistics.
Offered every fall.

HSA 557. STRATEGIC PLANNING AND MARKETING IN HEALTH CARE INSTITUTIONS **Three credits**

This course develops strategic planning and marketing concepts and applies them to health care institutions. Topics to be covered include the essential components of planning, environmental forecasting, the process of change, and evaluation techniques. The focus will be both macro and micro in nature. Addresses principles and practices of health care marketing.

Offered every spring.

HSA 558. HEALTH ECONOMICS **Three credits**

This course utilizes microeconomic theory to analyze the three major problems in the current health care system: costs, access, and health levels. Many of the economic concepts such as demand and supply theory, market structure, opportunity cost, cost-benefit analysis are examined, and possible solutions to these problems are offered.

Prerequisite: Undergraduate Microeconomics.
Offered every fall.

HSA 559. HEALTH ADMINISTRATION COLLOQUIUM: CAPSTONE COURSE **Three credits**

A public affairs colloquium which integrates the disparate interdisciplinary perspectives, concepts, ideas, and techniques students have acquired through the M.H.A. curriculum. Develops a critical appreciation of one's own personal perspective and competing perspectives as they relate to: (a) policy, organizational, and leadership issues; and (b) the future of health care and the student's place in it.

Prerequisite: 33 hours, including the completion of all CORE courses.
Offered every spring.

ELECTIVES (12 credits required: minimum 6 in HSA)

HSA 560. TOPICS IN HEALTH SERVICES ADMINISTRATION **Three credits**

Advanced study of various topics of special interest not extensively treated in regular courses.

Offered as available.

HSA 561. PERSPECTIVES ON AGING **Three credits**

Human development from adulthood through old age is analyzed. Main focus is upon social and emotional changes associated with various states of later adult life. The specific relationships between the graying of America, the subsequent development of chronic diseases and alternate health care delivery systems for the elderly will be discussed in detail.

Emphasis throughout the course will be on the older adult. Physiological development and the differentiation between normal age changes and disease states will be explored.

Prerequisite: Graduate Standing.

HSA 562. LONG-TERM CARE ADMINISTRATION **Three credits**

This course will emphasize the use of management principles and skills in long-term care institutions. Particular emphasis will be placed on planning and controlling along with better usage of manpower to increase productivity.

HSA 563. POLICIES AND PROGRAMS FOR THE ELDERLY **Three credits**

This course examines the specific sociodemographical, political, and economic factors that affect national and state policies which in turn affect programs targeted for the elderly. Special attention is given to how Social Security and other private and public income maintenance programs, Medicare, the Older Americans Act, and other public and private initiatives attempt to improve the lives and health of the elderly. Given the growth of the aging society, problems of maintaining present policies and programs into the future are examined. Finally, how policies and programs for the elderly affect the nursing home industry and other long-term institutions are considered.

HSA 564. HEALTH CARE MARKETING **Three credits**

A study of the marketing as it is applied specifically in the health care industry. Emphasis is placed on product determination, use of controllable variables, targeting, market-mix analysis, and feasibility analysis relative to "social good," third-party financing, and legal and traditional restraints.

HSA 565. MARKETING RESEARCH AND INFORMATION SYSTEMS **Three credits**

With cost containment and increasing competition continuing as vital issues, the health care system in the U.S. is in a dynamic state of change. This course provides a fundamental orientation to health marketing and advertising and to the fundamentals of marketing research covering research design through focus groups, questionnaires, interviewing, and sales forecast and promotion. Marketing to the physician, advertising, and evaluation of promotional efforts are also emphasized. This course will provide a practical overview of health care marketing, with particular emphasis on the elements of a strategic market.

HSA 566. ADVANCED HEALTH CARE FINANCE **Three credits**

A study of the financial mechanisms of the health care industry. Particular attention will be paid to the prospective reimbursement procedure which will include government reimbursement formulas, diagnosis-related groups and third-party payment. Cost containment methods, benefit design, system restraints and contract considerations will also be studied.

Prerequisite: HSA 555, or permission of instructor.

HSA 567. HEALTH CARE SUPERVISION **Three credits**

This course is designed to build the skills and conceptual underpinnings of today's line manager in health administration. Objectives include: 1) line manager skills development in the areas of planning, employee development, daily communications, and unit performance assessment; 2) self-conscious development of a management style maximizing organizational effectiveness and efficiency; and 3) expanded awareness of strategies for dealing with operating constraints in mid-level management positions.

HSA 568. LABOR/MANAGEMENT RELATIONS IN HEALTH CARE **Three credits**

Explains the basis for labor-management relations in health care institutions. The collective bargaining process, contract administration and labor relations for public employees will be examined in great detail. Particular attention will be paid to the right of health care employees to strike and the effect it has on the health care industry.

HSA 569. AMBULATORY CARE MANAGEMENT **Three credits**

Examines the organizational and management of ambulatory care practice, including application of research and theory. Provides skills related to planning, coordinating, marketing, quality assessment, consumer and provider satisfaction, personnel management, and financing ambulatory care facilities. Focuses on solo and medical group management.

HSA 570. MANAGEMENT OF HEALTH MAINTENANCE ORGANIZATIONS (HMOs) **Three credits**

Health maintenance organizations are designed to promote health and reduce the cost of medical care. This course examines the fundamentals of prepaid group practices, unique organization of HMOs and its advantages, and other alternative financing/delivery mechanisms. Current research is used to examine the success of HMOs in meeting expectations of the federal government, medical community and employers. Emphasis on planning, development and operation of HMOs, including discussion of financial issues, consumers and providers of care.

Prerequisite: HSA 552, or permission of instructor.

HSA 571. COMPARATIVE NATIONAL HEALTH CARE SYSTEMS **Three credits**

Examines the similarities and differences in organizational structure, planning, and policy of health care systems in selected industralized nations. The findings of the selected industralized nations are used to assess the future directions of U.S. health policy.

HSA 572. INTERPERSONAL SKILL DEVELOPMENT AND COMMUNICATION FOR HEALTH CARE MANAGERS **Three credits**

The course provides a framework for a better understanding of interpersonal relationships and effective communication in health care organizations. The focus is on the development of interpersonal and communication skills so that managers can solve interpersonal problems that typically occur between people and enhance organizational effectiveness. Extensive case studies and simulations are used for skill building. This course is particularly helpful for physicians, and for junior and mid-level managers.

HSA 573. CONTEMPORARY PRACTICES AND PROBLEMS IN HOSPITAL ADMINISTRATION **Three credits**

Focuses on the administration of hospitals and its multi-faceted problems. Examines the basic organization of hospital operations, including functions of the board of directors, interrelationships of clinical, support and administrative departments, and the role of the hospital administrator/CEO in providing effective leadership. Extensive case studies are used.

HSA 574. MEDICAL MANAGEMENT INFORMATION SYSTEMS: A MANAGERIAL PERSPECTIVE **Three credits**

Provides the conceptual foundations, structures and developments of medical management information systems. Focuses on design and implementation of operational health care management information system including manpower planning and productivity, financial planning and monitoring, quality assurance, patient care systems and the various uses of computer technology in health care.

HSA 575. PUBLIC HEALTH ADMINISTRATION **Three credits**

Examines contemporary public health issues and the role of the public health manager. Provides the student with fundamentals of public health program development, implementation and evaluation. Application of management theory and skills to the administration of public health programs and facilities is covered.

HSA 576. CONTEMPORARY DRUG AND ALCOHOL ISSUES **Three credits**

This course utilizes a multi-disciplinary approach to providing the health care manager with a comprehensive understanding of the multi-faceted human and management problems arising from drug and alcohol use and misuse. The contemporary health care manager must be knowledgeable of the complexities of addiction in the workplace. Course material will address drug testing, identification, confrontation, and referral of the impaired employee; causitive factors contributing to addiction; and implementation of employee assistance programs.

HSA 577. PRINCIPLES OF EPIDEMIOLOGY **Three credits**

Identifies factors relative to man and his environment which influence the occurrence of disease and provides a basis for programs in preventative medicine and therapeutic modalities and of new organizational patterns of health care delivery. Topics, among others, include epidemiological methods; indices of morbidity and mortality; evaluation of diagnostic and screening tests; measurement of disease risk; health services evaluation; and legal, ethical and policy aspects of epidemiology. Emphasis on clinical trials, prospective studies, and case-control studies. Selected epidemiological diseases, such as, measles, cardiovascular, and hospital acquired infections are discussed.

HSA 590. GRADUATE INTERNSHIP **Three credits**

Designed to provide practical administrative experiences in a health services agency or organization. The course is relevant only for students who do not have any working experience in a health care setting.

Prerequisite: Permission of the Program Director at least three months in advance and completion of core courses, except HSA 599.

HSA 595. HEALTH SERVICES INDEPENDENT STUDY **Three credits**

Independent study and research for advanced students.

Offered as required.

School of Science and Engineering

Umid R. Nejib, (Ph.D.) *Dean*
Brian T. Redmond, (Ph.D.) *Associate Dean*

Ahmad Armand, (Ph.D.) *Acting Chairperson*
Engineering

James J. Bohning, (Ph.D.) *Chairperson*
Earth & Environmental Sciences

Lieutenant Colonel Arthur Matson, (M.S.) *Chairperson*
Aerospace Studies

Roger L. Maxwell, (Ph.D.) *Chairperson*
Physics

Samuel Merrill, III, (Ph.D.) *Chairperson*
Mathematics & Computer Science

Ralph B. Rozelle, (Ph.D.) *Dean*
Health Sciences

Thyagarajan Srinivasan, (M.S.) *Chairperson*
School Committee on Graduate Studies

Owen D. Faut, (Ph.D.) *Chairperson*
Chemistry

Lester J. Turoczi, (Ph.D.) *Chairperson*
Biology

The School of Science and Engineering offers the following graduate programs.

A. Master of Science in
1. Electrical Engineering
2. Mathematics
3. Physics

B. Master of Science in Education with concentration in
1. Biology
2. Chemistry
3. Mathematics
4. Physics

C. A 5-Year B.S.-M.S. degree in Mathematics.

ADMISSION

The following requirements apply to all the degree programs listed above.

a. **Degree Track**

For admission to the graduate program, the applicant should submit the documents listed. However, if the items marked with an (*) are not included, the student's file will be reviewed and a conditional admission may be granted.

The requirements are:

1. Completed Graduate Division application.
2. Official academic transcripts.
3. Up-to-date resume (*).
4. Two letters of recommendation.
5. A copy of the undergraduate degree, from an accredited institution, in the same field that the applicant is seeking admission. Degrees in related fields can qualify subject to review and approval by the school graduate committee.
6. GRE, General and Subject, scores (*). (Not needed for Education degrees.)

Foreign applicants should meet language, financial, and immigration requirements designated by the Graduate Studies Division. Advanced standing or transfer credit requests, if applicable, should be made at the time of initial application. These are limited to 6 credits.

b. **Non-Degree Track**

Applicants under this category will not be considered for a degree. However, they are allowed to enroll in graduate classes provided they satisfy the requirements listed and the prerequisites for the specific courses. Such students may elect to change their status to the degree track by satisfying the requirements listed above.

The requirements are:

1. Completed Graduate Division application.
2. Academic transcripts.
3. Up-to-date resume.
4. One letter of recommendation.

Biology

Lester J. Turoczi, (Ph.D.) *Chairperson*

Master of Science in Education

ADMISSION

Refer to the general admission requirements on page 68.

DEGREE REQUIREMENTS

Candidates for the degree of Master of Science in Education with a program in Secondary Education/Biology must take eighteen hours of biology in courses numbered 301 or above. Chemistry 361, 362, and 363 may be taken for credit toward the biology component with the prior approval of the Chairperson of the Biology Department.

Requirements for the education component of the Master of Science in Education, with a major in biology, are listed under Education on page 34.

COURSES OF INSTRUCTION

BIOLOGY 303. BACTERIOLOGY **Four credits**

Biology 303 covers generally the morphology and identification of bacteria. Laboratory work includes microscopy, techniques of making media, methods of sterilization, and the culturing of bacteria. Fee: $35.

Prerequisites: Biology 121-122, 221-222, or permission of instructor.

BIOLOGY 304. LIFE OF THE VERTEBRATES **Three credits**

This course presents a view of chordate animals with particular emphasis on the natural history, evolution, and classification of these forms. Lecture, two hours a week; laboratory, three hours a week. Fee: $35.

Prerequisites: Biology 121-122, 221-222, or permission of instructor.

BIOLOGY 305. INVERTEBRATE BIOLOGY **Four credits**

A study of the major invertebrate phyla with respect to their taxonomy, evolution, morphology, physiology and ecology. Fee: $35.

Prerequisites: Biology 121-122, 221-222, or permission of instructor.

BIOLOGY 308. GENETICS **Four credits**

This course will present a detailed treatment beyond the introductory level with particular emphasis on populational aspects of heredity. Topics will include plant and human genetics. Lecture, three hours a week; laboratory, three hours a week. Fee: $35.

Prerequisites: Biology 121-122, 221-222, or permission of instructor.

BIOLOGY 309. EVOLUTION **Three credits**

Evolution is a study of how new species of organisms are derived from previously existing species. Emphasis is placed upon the processes of organic evolution and the development of the evolutionary ideas. Fee: $15.

Prerequisites: Biology 121-122, 221-222, or permission of instructor.

BIOLOGY 310. ANIMAL BEHAVIOR **Four credits**

A course emphasizing behavior as the response of an organism to physical and social environmental change, and covering the processes that determine when changes in behavior occur and what form they will take. Laboratories, using living local fauna, will demonstrate principles discussed in lecture. Fee: $35.

Prerequisites: Biology 121-122, 221-222, or permission of instructor.

BIOLOGY 312. COMPARATIVE PHYSIOLOGY **Four credits**

Advanced physiology encompasses the study of organ functions and organ system functions in different animal groups. Emphasis will be on the systemic physiology of vertebrate animals. Lecture, three hours a week; laboratory, three hours a week. Fee: $35.

Prerequisites: Biology 121-122, 221-222, or permission of instructor.

BIOLOGY 313. PARASITOLOGY **Three credits**

Parasitology is the study of organisms that live on or within other organisms and the relationship of these organisms to their hosts. This course deals with the common parasites that infect man and other animals. Lecture, two hours a week; laboratory, three hours a week. Fee: $35.

Prerequisites: Biology 121-122, 221-222, or permission of instructor.

BIOLOGY 315. MOLECULAR BIOLOGY **Three credits**

Molecular Biology is the study of the energetics, metabolism, and biochemical aspects of living systems. A general biochemical presentation will be provided with reference to proteins, carbohydrates, and lipids with extensive coverage of molecular genetics. Lecture, three hours a week.

Prerequisites: Biology 121-122, 221-222, Chemistry 231-232, or permission of instructor.

BIOLOGY 317. ECOLOGY **Four credits**

Ecology examines contemporary ecological thinking as it pertains to the inerrelationship of organisms and their environments. Interactions at the population and community levels are emphasized. Lecture, three hours a week; laboratory, three hours a week. Fee: $35.

Prerequisites: Biology 121-122, 221-222, or permission of instructor.

BIOLOGY 318. DEVELOPMENTAL BIOLOGY **Three credits**

A course dealing with principles of organismic development, gametogenesis, fertilization, cleavage, embryogenesis, differentiation, morphogenesis, regeneration. Laboratory work includes vertebrate embryology, microtechnique, and some experimentation. Lecture, two hours; laboratory, three hours a week. Laboratory fee: $35.

Prerequisites: Biology 121-122, 221-222, or permission of instructor.

BIOLOGY 319. PLANT DIVERSITY **Four credits**

A comprehensive survey of bryophytes, vascular plants and plantlike organisms (fungi and algae) emphasizing their structure, reproductive biology, natural history, evolution, and importance to humans. Lecture, three hours per week; laboratory, three hours per week. Laboratory fee: $35.

Prerequisites: Biology 121-122, 221-222, or permission of instructor.

BIOLOGY 320. PLANT FORM AND FUNCTION **Four credits**

An introduction to the morphology, anatomy, cytology and physiology of plants, with emphasis on the vascular plants. Structural and functional aspects of plants will be interpreted in relation to each other and within ecological and evolutionary contexts. Lecture, three hours per week; laboratory, three hours per week. Laboratory fee: $35.

Prerequisites: Biology 121-122, 221-222, or permission of instructor.

BIOLOGY 321. MAMMALIAN PHYSIOLOGY **Four credits**

This course examines the function of mammalian systems with regard to homeostasis, growth, and reproduction. Emphasis is on human physiology; however, other mammalian systems are discussed to demonstrate physiological adaptability to various environmental situations. Lecture, two hours; laboratory, three hours per week. Laboratory fee: $35.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.
Offered fall semesters.

BIOLOGY 322. FUNCTIONAL HISTOLOGY **Four credits**

This course emphasizes the microscopic examination of mammalian tissues from morphological and physiological perspectives. Reference is made to organ embryogenesis to support the understanding of organ form and function. Tissue preparation for histological examination is demonstrated. Lecture, two hours; laboratory, three hours per week. Laboratory fee: $35.

Prerequisites: Bio 121-122, 221-222, or permission of instructor.
Offered spring semesters.

BIOLOGY 323. ELECTRON MICROSCOPY FOR LIFE SCIENCES **Three credits**

A comprehensive course in the basic principles and practice of scanning electron microscopy plus introductions to older and newer types of electron microscopy. Lectures and laboratories emphasize scanning electron microscopy techniques for students preparing their own biological specimens and recording their own electron micrographs. Lecture, two hours a week; laboratory, three hours a week. Laboratory fee: $35.

Prerequisites: Bio 121-122, 221-222, or permission of department chairperson.

BIOLOGY 340. LIMNOLOGY **Three credits**

A study of the chemical, physical, and biological aspects of fresh water systems. Laboratory investigations will consist of in-depth analyses of local lakes and streams. Lecture, two hours a week; laboratory, three hours a week. Fee: $35.

Prerequisites: Biology 121-122, 221-222, or permission of instructor.

BIOLOGY 341. IMMUNOLOGY AND IMMUNOCHEMISTRY **Four credits**

This course is concerned with the biologic mechanisms and chemistry of reactants and mediators associated with natural and acquired states of immunity, tissue and blood serum responses to infection and immunization, and related patho-physiologic alterations of hypersensitivity, phenomena in vertebrate animals and man. A background in microbiology, physiology, and biochemistry is advisible. Lecture, three hours a week; laboratory, three hours a week. Fee: $35.

Prerequisites: Biology 121-122, 221-222, or permission of instructor.

BIOLOGY 385. FIELD BOTANY **Three credits**

This is a specialized summertime field course which emphasizes a taxonomic, phylogenetic, and ecological survey of higher plants indigenous to Northeastern Pennsylvania. Due to the extensive field work, enrollment is somewhat more restricted than in other courses; therefore, written permission from the instructor is the prime prerequisite of those upperclassmen wishing to register for the course.

Prerequisites: Biology 121-122, 221-222, or permission of instructor.

BIOLOGY 394. BIOLOGICAL FIELD STUDY **Three credits**

On-site study of biological problems or situations incorporating documentation and investigation techniques. May be repeated for credit when no duplication of experience results. One hour of lecture per week, plus field trip. Fee: Variable.

Prerequisites: Biology 121-122, 221-222, or permission of instructor.

BIOLOGY 398. TOPICS **Three credits**

A study of topics of special interest not extensively treated in regularly offered courses.

Prerequisites: Biology 121-122, 221-222, or permission of instructor.

Chemistry

Owen D. Faut, (Ph.D.) *Chairperson*

Master of Science in Education

ADMISSION

Refer to the general admission requirements on page 68.

The applicant should have a baccalaureate degree from an accredited institution, with a minimum of 35 semester credit hours in chemistry. In addition, a year of physics and a working knowledge of calculus and differential equations are required. Students deficient in any of these areas may, at the discretion of the chemistry faculty, be granted provisional admission.

DEGREE REQUIREMENTS

General requirements for the Master of Science in Education with a program in Secondary Education/Chemistry are listed under Education on page 34. Specific chemistry requirements will be outlined by the student's advisor in the chemistry department.

COURSES OF INSTRUCTION

CHEMISTRY 323. ADVANCED INORGANIC CHEMISTRY **Three credits**

Introduction to ligand and field theory; chemistry of the first transition series, organometallic, and pi-acceptor compounds; mechanisms of inorganic reactions.

Prerequisite: Chemistry 222 and 252.

CHEMISTRY 361. BIOCHEMISTRY I **Three credits**

A study of the physical and chemical properties of biological molecules with emphasis on physical methods of biochemistry, proteins, enzyme kinetics, bioenergetics, nucleic acids, and carbohydrates.

Prerequisite: Chemistry 232.

CHEMISTRY 362. BIOCHEMISTRY II **Three credits**

A study of metabolism with emphasis on metabolic regulation.

Prerequisite: Chemistry 232.

CHEMISTRY 398. TOPICS **Three credits**

A study of topics of special interest not extensively treated in regularly offered courses.

Prerequisite: Permission of the instructor.

Engineering

Ahmad Armand, (Ph.D.) *Acting Chairperson*

Master of Science in Electrical Engineering (MSEE)

ADMISSION

Refer to the general admission requirements on page 68. An applicant should possess a B.S. degree in Electrical Engineering. Applicants not meeting the requirements set by the School Committee on Graduate Studies may be provisionally admitted and will be required to take sufficient undergraduate courses. Good scores in GRE, General and Engineering, are expected.

DEGREE REQUIREMENTS

Thirty-three (33) credit hours are required for the M.S.E.E. degree. These include the following:

03 credits	Egr 400
18 credits	six BACKGROUND courses, at least three (3) of which must be designated CORE courses, including EE 401
06 credits	two ADVANCED graduate courses (listed 500-level courses)
06 credits	A research-oriented THESIS, EE 590

CORE courses are those so designated in the catalogue course description on the following pages.

The BACKGROUND courses consist of any of the following:

All EE 400-level and above courses

Any Egr, MaE, Phy, Mth, and CS 400-level and above courses (with advisor approval)

Any 300-level course on current M.S.E.E. PREFERENCE LIST

Note that maximum of six (6) designated 300-level course credits and a maximum of three (3) 500-level course credits may be used to satisfy the BACKGROUND requirement.

ADVANCED courses, consisting of all listed 500-level courses, and THESIS, can only be taken by students who have achieved CANDIDATE status, or by written permission of the instructor. Both full- and part-time students are limited to a maximum of 3 thesis credits in any single term.

The minimum acceptable grade point average is 3.0 with no more than two grades below 3.0 being allowed. When a student has completed the 9 credit CORE requirement he or she is eligible for CANDIDATE status. The school graduate committee will then review the student's progress and should have an up-to-date record and resume for purposes of advisement. All requirements for the degree must be completed within two years of the end of the term in which candidacy status is achieved.

Advanced standing or transfer credit is limited to six (6) graduate credits. Petitions should be submitted to the school graduate committee and should document minimum competency defined as relevant graduate coursework at an accredited institution with an earned minimum grade of 3.0 (0-to-4 scale) or equivalent expertise.

A research-oriented thesis is compulsory. Consequently, the student should direct his or her studies toward the thesis in consultation with the advisor. Ordinarily, thesis topics will touch on one or more of the following areas:

Microwave and Communication
Solid State Devices
Power and Control Systems
Computers and Digital Systems

The thesis shall be defended in an open oral presentation. Three persons, including the faculty thesis advisor as chairperson, constitute a thesis committee. One member of this committee will be from outside the department.

FINANCIAL AID

A limited number of assistantships are available for full-time students.

COURSE DESCRIPTIONS

Students will be advised of the course offerings, sequencing, and prerequisites upon admission. The faculty advisor will be in a position to recommend courses to the student taking into account the time-table and the necessary prerequisites. Assessments and recommendations will be made by the department graduate committee.

The 500-level courses are restricted to students who have achieved candidacy status or by written permission of the instructor. All 400-level courses require a background based on 300-level courses or the equivalent of the B.S. degree.

EE 401. ANALYSIS **Three credits**

The analysis of some physical and abstract problems using well developed mathematical techniques such as contour integration; integral transforms; matrices; Bessel; Legendre; or Laguerre polynomials; FFT's; difference equations; and numerical methods. (Same as Phys 401)

CORE course.

EE 410. LINEAR SYSTEM THEORY **Three credits**

Linear spaces and linear operators; input-output systems and state variables; linear dynamical equations and impulse response matrices; controllability, observability and their applications to minimal realizations; state feedback controllers and observers; multivariable systems. (Same as Phy 410)

Prerequisite: EE 214.
CORE course.

EE 414. FEEDBACK CONTROL SYSTEMS **Three credits**

A review of mathematical models for physical systems. Block diagram simplifications; sensitivity measure and performance of control systems; state space representations; stability analysis; the Routh Hurwitz criterion; the root locus method; Bode plots; and the Nyquist criteria; lead and lag compensator design; design with state space representations.

Prerequisite: EE 214.

EE 415. DIGITAL CONTROL SYSTEMS DESIGN **Three credits**

Review of design and compensation of control systems. State space analysis of continuous-time and discrete-time systems; discrete-time observations, control and feedback; digital regulators design; digital tracking systems design; controlling continuous-time systems.

Prerequisite: EE 414.

EE 416. ROBOT VISION **Three credits**

Image formation and image sensing; binary images; geometrical and topological properties; reflectance map; photometric stereo, shape, and shading; motion field and optical flow; extended Gaussian images; picking parts out of bin.

Prerequisite: First course in Robotics.

EE 421. POWER SYSTEM ANALYSIS **Three credits**

Review of power generation schemes. Transmission line calculations and power system representation; network solution by matrix transformations; symmetrical components; symmetrical and unsymmetrical fault analysis of power systems; load flow analysis.

Prerequisite: EE 321.

EE 425. POWER ELECTRONICS **Three credits**

SCR characteristics; turn-on and turn-off mechanisms; SCR connections; power and switching devices, including UJT, triac and special devices; AC power control: full-wave control, half-wave control, and phase control; line-commutated converters and inverters; chopper circuits; applications.

Prerequisite: EE 252, EE 321.

EE 432. ELECTROMAGNETIC FIELDS AND WAVES **Three credits**

Maxwell's equations; energy and momentum in the electromagnetic field; plane, cylindrical, and spherical waves; boundary conditions; cylindrical waveguides; cavity resonators; scattering by a sphere and other geometries. (Same as Phys 432)

Prerequisite: EE 332.
CORE Course.

EE 435. MICROSTRIP CIRCUIT DESIGN **Three credits**

A review of TEM mode transmission line theory. Static TEM parameters and design; discontinuities in microstrip and coupled microstrip lines; design examples of passive microstrip elements; introduction to narrowband and wideband microwave amplifiers.

Prerequisite: EE 332.

EE 436. ANTENNA THEORY AND DESIGN **Three credits**

Electromagnetic vector potentials; Green's functions; radiating systems; image theory; reciprocity; directional arrays; linear and broadband antennas; moment method; aperture antennas; microstrip antennas, and antenna synthesis.

Prerequisite: EE 335.

EE 441. DIGITAL SYSTEMS DESIGN **Three credits**

Principles of digital design; combinational circuit design and sequential circuit design; multi-input controller design; programmable system controllers; synchronous and asynchronous finite state machines design.

Prerequisite: EE 342.

EE 451. OPTO-ELECTRONICS **Three credits**

Electromagnetic theory; propagation of rays; propagation of optical beams in homogeneous and guiding media; optical resonators; interaction of radiation and atomic systems; theory of laser oscillators; some specific laser systems; second-harmonic generation and parametric oscillation; electroptic modulation of lasers; optical radiation interaction of light and sound; propagation, modulation, and oscillation in optical dielectric waveguides; laser applications; fiber optics and couplers.

Prerequisite: EE 332, EE 401.

EE 460. STOCHASTIC PROCESSES IN ENGINEERING **Three credits**

Review of probability. Random variables and random processes; functions of one and two random variables; expectations; moments and characteristic functions; correlation and power spectra; stationary and nonstationary processes, harmonic analysis of random processes.

Prerequisite: EE 214.
CORE course.

EE 461. DIGITAL COMMUNICATIONS **Three credits**

Sampling theory; analog pulse modulation; time-division multiplexing; baseband digital transmission; bandlimited digital PAM systems; synchronization techniques; PCM, PCM with noise, DPCM and DM; digital multiplexing; error correction and detection; linear block codes; convolutional codes; bandpass digital transmission; coherent and noncoherent binary systems; quadrature carrier and M-ary systems; information theory.

Prerequisite: EE 361, EE 460.

EE 465. DIGITAL SIGNAL PROCESSING **Three credits**

Z transforms; Fourier transforms; discrete Fourier transforms; sampling theorem; analog filter approximations; digital filter realizations and topological properties; analysis and design of recursive (IIR) filters and non-recursive (FIR) filters; fast Fourier transforms.

Prerequisite: EE 214, EE 252.

EE 471. ADVANCED SOLD STATE DEVICES **Three credits**

Review of semiconductor fundamentals. Physics, fabrication technologies, and operational characteristics of a variety of solid-state structures including p-n junctions, bipolar transistors, thyristors, metal-semi-conductor contacts, JFET and MESFET, MIS and CCD, MOSFET, microwave and photonic devices including IMPATT, BARITT, TED, LED, semiconductor lasers, photodetectors, and solar cells.

Prerequisite: EE 272.

EE 474. INTEGRATED CIRCUIT DESIGN **Three credits**

Model calculations, transfer characteristics and use of SPICE for MOS devices and circuits; basic logical units; integrated systems fabrication including scaling, channel properties, yield statistics, design rules and choice of technology; data and control flow including clocks, registers and PLA'S; design implementation from circuit topology to patterning geometry and wafer fabrication; CAD; overview of LSI and VLSI systems; architecture and design of system controllers; system timing (SPICE); physical aspects of computational systems; ASICs memories and other logical circuits.

Prerequisite: EE 272, EE 341.

EE 481. ADVANCED MICROELECTRONICS LAB **Three credits**

Theoretical and practical aspects of techniques utilized in the fabrication of semiconductor devices. Techniques of wet chemistry; deposition and diffusion; advanced concepts of contamination control; defect-free processing and gettering; complete characterization including junction penetration, resistivity, and oxide thickness. Switching speed, junction characteristics, leakage and gain, ion implantation, and method of fabrication. Extensive use of process simulation programs such as SUPREM.

Prerequisite: EE 272.

EE 482. ADVANCED COMMUNICATION AND ANTENNA LAB **Three credits**

Characterization and measurement of microwave devices and systems; emphasis on antenna design and testing; utilization of the network analyzer and spectrum analyzer; antenna pattern measurements; communication link design; computer-aided design of active and passive microwave circuits; touchstone, optical signal generation and modulation.

Prerequisite: EE 335.

EE 498. TOPICS IN ELECTRICAL ENGINEERING **Three credits**

Selected topics in electrical engineering. These may include one or more of the following: control systems, information theory, signals and noise measurements, communication systems, network design and synthesis, solid state, quantum electronics, magnetic and non-linear circuits, digital and analog systems, computer systems, medical engineering, power systems and generation. May be repeated for credit.

EE 510. OPTIMAL FILTERING THEORY **Three credits**

Review of stochastic processes. stochastic integrals and differential equations; Wiener filtering; discrete Kalman filter; applications and additional topics on discrete Kalman filtering; continuous Kalman filter; discrete smoothing and prediction; additional topics on Kalman filtering.

Prerequisite: EE 410, EE 460.

EE 514. OPTIMAL CONTROL THEORY **Three credits**

The calculus of variations and the minimum principle; optimal control of discrete-time systems; optimal control of continuous-time systems; dynamic programming; models of dynamic systems; optimal estimation; stochastic neighboring optimal control. (Same as Phy 514)

Prerequisite: EE 410.

EE 516. ROBOTICS AND ARTIFICIAL INTELLIGENCE **Three credits**

Prospects for knowledge-based robots; robots and artificial intelligence; expert systems and knowledge-based languages; production-rule expert systems; search techniques; heuristic graph searching; AND/OR graphs; first order predicate logic; future prospects for knowledge-based robots.

Prerequisite: First course in Robotics.

EE 521. COMPUTER AIDED ANALYSIS OF POWER SYSTEMS **Three credit**

Bus impedance and bus admittance matrices; sparsity programming and triangular factorization. Load-flow studies; Gauss, Gauss-Seidel, Newton-Raphson methods. Approximate, fast and special-purpose load-flow studies. Optimal dispatch: equal incremental cost rule; gradient dispatch; optimal reactive power dispatch methods.

Prerequisite: EE 421.

EE 535. MICROWAVE CIRCUITS **Three credits**

Microwave networks; S-parameters and stability considerations; characterization of transmission line structures and discontinuities; models of microwave solid state devices; measurement techniques for modeling; design synthesis; optimization and analysis of microwave integrated circuits; numerical methods.

Prerequisite: EE 435.

EE 541. MICROPROCESSOR-BASED SYSTEMS DESIGN **Three credits**

Brief review of some typical 8-bit and 16-bit microprocessors; hardware and software aspects of the design of modern microcomputer systems; architecture and design of input/output systems; mass storages; high speed memories; logic devices; timing units; interrupt systems; bus interfacing and multiprocessing.

Prerequisite: EE 441.

EE 560. DETECTION AND ESTIMATION THEORY **Three credits**

Probabilistic signal detection and parameter estimation theory. Decision criteria, performance, likelihood, Bayes and parameter estimation; random processes, detection and estimation of white and nonwhite Gaussian noise. Kalman and Wiener filters.

Prerequisite: EE 460.

EE 561. COMPUTER COMMUNICATION NETWORKS **Three credits**

Data/computer communication network structures; the structure and function of network protocols; data link control procedures; multiple-access protocols; wideband data transmission media; functions and characteristics of devices used in computer communications; analysis of data/computer networks.

Prerequisite: EE 461.

EE 562. OPTICAL COMMUNICATION **Three credits**

Structure and waveguiding fundamentals of optical fibers; signal degradation in optical fibers; optical sources and their characteristics; power launching and coupling; photodetectors; optical receiver operation; coherent and non-coherent detection; analysis and design of optical transmission links.

Prerequisite: EE 432, EE 461.

EE 565. DIGITAL IMAGE PROCESSING **Three credits**

Scenes, images and digital pictures; linear operations on pictures; discrete picture transforms; random variables and random fields; visual perception. Sampling using array of points and orthonormal functions; quantization; Karhunen-Loeve, Fourier, Hadamard, and cosine compression; predictive block truncation, error-free compression; rate-distortion function. Enhancement: gray scale modification, sharpening and smoothing; restoration: inverse least-squares and recursive filtering, constrained deconvolution.

Prerequisite: EE 401, EE 460.

EE 571. MODERN SOLID STATE DEVICES AND DESIGN **Three credits**

Semiconductor fundamentals at an advanced level. Silicon and GaAs, MOS devices; processing details; performance limitations; process design for given device specifications; limitations due to fabrication techniques; quantum phenomena in a variety of modern high performance devices; microwave semiconductor devices; integrated circuit design; VLSI design; computer aids for process and circuit design.

Prerequisite: EE 471.

EE 590. THESIS **One to Three credits**

EE 598. ADVANCED TOPICS IN ELECTRICAL ENGINEERING **Three credits**

Advanced topics in electrical engineering. These may include one or more of the following: control systems; information theory; signals and noise measurements; communication systems; network design and synthesis; solid state; quantum electronics; magnetic and non-linear circuits; digital and analog systems; computer systems; medical engineering; power systems and generation. May be repeated for credit.

EGR 400. ETHICS IN SCIENCE AND ENGINEERING **Three credits**

Ethical problems of scientists and technologists with an emphasis on modern case histories. The responsibilities and protections of professional status and the role of professional societies. Acceptable behavior; insider and outsider views.

EGR 471. EXPERT SYSTEMS IN COMPUTER INTEGRATED MANUFACTURING **Three credits**

Design of a prototype expert system using microcomputers to aid in the planning and control of manufacturing systems; computer modeling to enhance decision making in such areas as forecasting, inventory, production planning, scheduling, facility layout, queueing, and goal programming; design of the prototype expert system by combining those models into several knowledge-based systems.

EGR 498. SELECTED TOPICS IN ENGINEERING **Three credits**

Selected topics in engineering and related areas. These may include mechanical engineering, civil engineering, engineering management, geotechnology; radiation, etc.

EGR 598. ADVANCED TOPICS IN ENGINEERING **Three credits**

Advanced topics in engineering and related areas. These may include mechanical engineering, civil engineering, engineering management, geotechnology, radiation, etc.

MaE 451. ELECTRON OPTICS AND SURFACE ANALYSIS **Three credits**

Kinematic and dynamical contrast theory with regard to transmission electron microscopy; fundamentals of image processing; signal detection, chemical analysis, and applications in the following systems: Scanning Electron Microscopy (SEM), Energy Dispersive X-Ray Spectroscopy (EDS), Wave Length Dispersive Spectroscopy (WDS), Scanning Auger Microanalysis (SAM), Secondary Ion Mass Spectroscopy (SIMS), X-Ray-Photoelectron Spectroscopy (XPS).

Prerequisite: MaE 210, Phys 203.

MaE 498. SELECTED TOPICS IN MATERIALS ENGINEERING **Three credits**

Selected topics in materials engineering. These may include one or more of the following: X-ray diffraction; structure analysis; phase equilibria; metallurgy; ceramics; physical, mechanical, or electrical properties of materials. May be repeated for credit.

MaE 572. THIN FILM PROCESSING **Three credits**

Nucleation and growth theory; crystalline, amorphous, epitaxial growth morphology. Deposition techniques like DC, RF, Magnetron Sputtering, Ion beam sputtering, evaporation, chemical vapor deposition, physical vapor deposition. Structure, properties and applications for specific thin film processing techniques. (Two hours lecture/two hours laboratory per week).

Prerequisite: MaE 210, Phys 203.

MaE 598. ADVANCED TOPICS IN MATERIALS ENGINEERING **Three credits**

Advanced topics in materials engineering. These may include one or more of the following: X-ray diffraction; structure analysis; phase equilibria; metallurgy; ceramics; physical, mechanical, or electrical properties of materials. May be repeated for credit.

Mathematics

Samuel Merrill, III, (Ph.D) *Chairperson*

Master of Science

Master of Science in Education

THE COURSES OF STUDY ARE INTENDED FOR:

a. Students who plan to continue their studies beyond the master level.
b. Teachers of secondary or junior college mathematics who seek to strengthen their subject-matter competence, or
c. Persons seeking a terminal master degree to further their career in industry or government.

ADMISSION

Refer to the general admission requirements on page 68. Also, an applicant is expected to have completed courses in advanced calculus or real variables and in modern and linear algebra. Students with a weak mathematical background may be required to make up certain deficiencies before being admitted to candidacy.

DEGREE REQUIREMENTS

a. Master of Science — with a major in Mathematics:

A minimum of thirty credits of approved courses in Mathematics or Computer Science is required. All candidates are required to complete Mth 311, 331, and 214, or the equivalent, if they have not done so as undergraduates. At least six credits, exclusive of those for the optional thesis, must be in courses numbered above 500. No more than twelve credits of the 300-level courses may be applied towards this degree.

b. M.S. in Education — with a program in Secondary Education/Mathematics:

A minimum of thirty credits of approved courses, to be distributed as follows, is required.

1. See page 34 for education requirements.
2. Mathematics or Computer Science courses: 18 credits
   At least three credits must be in courses numbered above 400.

COURSES OF INSTRUCTION

MATHEMATICS 311. FUNCTIONS OF A REAL VARIABLE **Three credits**

A rigorous study of the topology of the real line, limits, continuity, differentiation, integration, and series of functions.

Offered in the fall semester of odd years.

MATHEMATICS 314. FUNCTIONS OF A COMPLEX VARIABLE **Three credits**

Complex functions, limit, continuity, analytic functions, power series, contour integration, Laurent expansion, singularities and residues.

Offered in the fall semester of even years.

MATHEMATICS 331. INTRODUCTION TO ABSTRACT ALGEBRA I **Three credits**

A study of elementary number theory, groups, rings, and fields.

Offered in the fall semester of even years.

MATHEMATICS 342. INTRODUCTION TO TOPOLOGY **Three credits**

Metric spaces, topological spaces, countability and separation axioms, compactness, connectedness, product spaces.

Offered in the spring semester of even years.
Prerequisite: Mth 311 or consent of instructor.

MATHEMATICS 343. INTRODUCTION TO GEOMETRY **Three credits**

A study of selected topics from Euclidean geometry, affine geometry, projective geometry, and convexity.

Offered in the fall semester of even years.

MATHEMATICS 351-352. PROBABILITY AND MATHEMATICAL STATISTICS I AND II **Three credits each**

Random variables, probability distributions, expectation and limit theorems, estimation, testing statistical hypotheses, confidence intervals.

351 is offered every fall;
352 is offered in the spring semester of odd years.

MATHEMATICS 361-362. INTRODUCTION TO APPLIED MATHEMATICS I & II **Three credits each semester**

Mathematics of physical science and engineering. Topics include: vector integral and differential calculus, power series, partial differential equations, Fourier analysis, and eigenvalue problems.

361 is offered every fall;
362 is offered every spring.

MATHEMATICS 364. NUMERICAL ANALYSIS **Three credits**

Numerical methods of differentiation, integration, solution to equations and of differential equations with emphasis on problems that lend themselves to solution on computers.

Prerequisite: A course in elementary differential equations and knowledge of Fortran or Pascal.
Offered in the spring semester of odd years.

MATHEMATICS 413. FUNCTIONS OF SEVERAL VARIABLES **Three credits**

A modern treatment of calculus of functions of several real variables. Topics include: Euclidean spaces, differentiation, integration and manifolds leading to the classical theorems of Green and Stokes.

Prerequisite: Mth 311 and a course in linear algebra.
Offered when demand warrants.

MATHEMATICS 432.
INTRODUCTION TO ABSTRACT ALGEBRA II **Three credits**

A continuation of Mathematics 331. Polynomial rings, ideals, field extensions and Galois Theory.

Prerequisite: Mth 331.
Offered when demand warrants.

MATHEMATICS 470.
READINGS IN MATHEMATICS **Three credits per semester**

Individual study of special topics under the supervision of a faculty member. Designed for students who have completed a substantial amount of course work in mathematics.

Prerequisite: Consent of department chairperson.
May be repeated for credit.

MATHEMATICS 511. MEASURE AND INTEGRATION **Three credits**

Measures, measurable functions, integration, convergence theorems, product measures, signed measures.

Prerequisite: Mth 342, or consent of instructor.
Offered when demand warrants.

MATHEMATICS 513. FUNCTIONAL ANALYSIS **Three credits**

Topics include: Banach spaces, Lp-spaces, Hilbert spaces, topological vector spaces, and Banach algebras.

Prerequisite: Mth 311 and a course in linear algebra.
Offered when demand warrants.

MATHEMATICS 532. MODERN ALGEBRA **Three credits**

A study of group theory (including the Sylow Theorems and solvable groups); ring theory (including the Noetherian rings and UFDs); modules, tensor algebra, and semi-simple rings.

Prerequisite: Mth 331 and a course in linear algebra or consent of instructor.
Offered when demand warrants.

MATHEMATICS 542. ALGEBRAIC TOPOLOGY **Three credits**

Polyhedra, simplicial homology theory, cohomology rings, and homotopy groups.

Prerequisite: Mth 342.
Offered when demand warrants.

MATHEMATICS 398/498/598. TOPICS IN MATHEMATICS **Variable**

A wide range of topics in pure and applied mathematics may be offered upon demand. May be repeated for credit.

Prerequisite: Consent of instructor.

MATHEMATICS 590. THESIS **Three or six credits**

Prerequisite: Consent of department chairperson.

The following computer science courses may be taken as part of either Masters' degree in Mathematics or Mathematics Education.

CS 321. SIMULATION AND DATA ANALYSIS **Three credits**

Methods of handling large data bases including statistical analysis and computer simulations. The emphasis will be upon discrete simulation models with a discussion of relevant computer languages, SLAM, GPSS, and/or SIMSCRIPT.

Prerequisite: Fortran and Pascal and one year of calculus.
Offered in the fall semester of even years.

CS 323. FORMAL LANGUAGES AND AUTOMATA THEORY **Three credits**

This course formalizes many topics encountered in previous computing courses. Topics include: languages, grammars, finite automata, regular expressions and grammars, context-free languages, push-down automata, Turing machines and computability.

Prerequisite: Mth 202 and CS 126.
Offered in the fall semester of even years.

CS 327. COMPILER DESIGN **Three credits**

A study of compiler design including language definition, syntactic analysis, lexical analysis, storage allocation, error detection and recovery, code generation and optimization problems.

Prerequisite: Computer Data Structures.
Offered in the spring semester of odd years.

CS 328. ANALYSIS OF ALGORITHMS **Three credits**

Theoretical analysis of various algorithms. Topics are chosen from sorting, searching, selection, matrix multiplication and multiplication of real numbers, and various combinational algorithms.

Prerequisite: Mth 202 and Computer Data Structures.
Offered in the spring semester of even years.

CS 367. COMPUTER GRAPHICS **Three credits**

Introduction to equipment and techniques used to generate graphical representations by computer. Discussion of the mathematical techniques necessary to draw objects in two and three-dimensional space. Emphasis on application programming and the use of a high-resolution color raster display.

Prerequisite: Computer Data Structures.
Offered in the fall semester of even years.

COMP. SCI. 408. MANAGEMENT INFORMATION SYSTEMS **Three credits**
(Same as Business Administration 508)

A general introduction intended to acquaint managers with the characteristics, selection, implementation, potentials, limitations and effects of modern management information systems. May not be counted for graduate credit in Mathematics and Computer Science without special permission.

Prerequisite: Admission to the MBA program or permission of the Department of Commerce and Finance or the Department of Mathematics and Computer Science. No computer programming background is assumed.

Five-Year B.S.-M.S. Degree — Mathematics Major

This program is designed for those who wish to attain a B.S. and an M.S. degree with a major in Mathematics at Wilkes and will enable them to complete all requirements for both degrees in at most five years. A mathematics major may apply for admission into this combined program during the sixth or the seventh term if he/she has a minimum average of 3.00 in all mathematics courses numbered above 300 and an overall average of 2.60 at the time of application. A form for this purpose is available from the department chairperson.

All requirements for both degrees must be met. In addition, Mth 511 and 532 are required. No credit shall be counted in both degree programs. Scheduling will be done so that the student will be eligible to receive a B.S. degree at the end of four years.

Physics

Roger L. Maxwell, (Ph.D.) *Chairperson*

Master of Science in Physics

ADMISSION

Refer to the general admission requirements listed on page 68. The applicant should possess a minimum of 24 hours of undergraduate credits in physics and produce acceptable GRE, General and Physics, scores.

Students entering into the M.S. program in physics may be assumed to have differing backgrounds and interests. All degree-track students, however, must complete the CORE which consists of three courses: Physics 401 (Analysis), Physics 432 (Electromagnetism) and Physics 452 (Quantum Mechanics). Accordingly, entering degree-track students must have sufficient background to enroll in at least two of these courses.

DEGREE REQUIREMENTS

Thirty-three (33) credit hours are required for the M.S. in Physics degree. These include the following:

03 credits	Egr 400
18 credits	six BACKGROUND courses, at least three (3) of which must be designated CORE courses, including Phy 401
06 credits	two ADVANCED graduate courses (listed 500-level courses)
06 credits	A research-oriented THESIS, Phy 590

CORE courses are those so designated in the catalogue course descriptions.

The BACKGROUND courses consist of any of the following:

All Phy 400-level and above courses
Any Egr, MaE, EE, Mth, and CS 400-level and above courses (with advisor approval)
Any 300-level course on current M.S. (Phy) PREFERENCE LIST

Note that maximum of six (6) designated 300-level course credits and a maximum of three (3) 500-level course credits may be used to satisfy the BACKGROUND requirement.

ADVANCED courses, consisting of all listed 500-level courses, and THESIS, can only be taken by students who have achieved CANDIDATE status, or by written permission of the instructor. Both full- and part-time students are limited to a maximum of 3 thesis credits in any single term.

The minimum acceptable grade point average is 3.0 with not more than two grades below a 3.0. When a student has completed the 9 credit CORE requirement he or she is eligible for CANDIDATE status. The school graduate committee will then review the student's progress and

should have an up-to-date record and resume for purposes of advisement. All requirements for the degree must be completed within two years of the end of the term in which candidacy status is achieved.

Advanced standing or transfer credit is limited to six (6) graduate credits. Petitions should be submitted to the School graduate committee and should document minimum competency defined as relevent graduate coursework at an accredited institution with an earned minimum grade of 3.0 (0-4 scale) or equivalent expertise.

A research-oriented thesis is compulsory. Consequently, the student should direct his or her studies toward the thesis in consultation with the advisor. The thesis shall be defended in an open oral presentation. Three persons, including the faculty thesis advisor as chairperson, constitute a thesis committee. One member of this committee will be from outside the department.

FINANCIAL AID

A limited number of assistantships are available for full-time students.

COURSE DESCRIPTIONS

Students will be advised of course offerings, sequencing, and prerequisites upon admission. The faculty advisor will be in a position to recommend courses to the student taking into account the time-table and the necessary prerequisites. Assessments and recommendations will be made by the school graduate committee.

The 500-level courses are restricted to students who have achieved candidacy status or by written permission of the instructor. All 400-level courses require a background based on 300-level courses or the equivalent of the B.S. degree.

COURSES OF INSTRUCTION

300-Level Approved Graduate Courses

(**Note:** The following 300-level courses are those currently approved for credit in the M.S. in Physics curriculum. For a complete list of 300-level physics courses refer to the current Wilkes undergraduate BULLETIN).

PHY 301. MATHEMATICS METHODS I **Three credits**

Study of different areas of mathematics ad their application in physics, engineering, and the sciences. Topics include ordinary and partial differential equations, fourier methods, complex variables, matrix methods, Green's functions, tensor analysis, group theoretical methods, and others.

PHY 302. MATHEMATICAL METHODS II **Three credits**

Continuation of Physics 301.

PHY 310. ANALYTICAL MECHANICS **Three credits**

An intermediate level course designed to develop an understanding of the principles of mechanics based on the Newtonian as well as the Lagrangian and Hamilton formulations. The application of matrices, tensors, and differential equations and advanced techniques to the solution of mechanics problems. Topics include harmonic oscillations, central force problems, rigid body motions, inertia and stress tensors, elastic waves, eigenvalue problems, normal coordinates and finite symmetry groups. Recitation-lecture three hours a week.

PHY 323. X-RAY DIFFRACTION/LAB **Four credits**

Study of structure and composition of solids using x-rays. Effects of annealing, sub-structures, cold work, preferred orientation, and ordering. Principles of design and applications of x-ray diffraction techniques. Three hours lecture and one three-hour laboratory a week. Fee: $35. (Same as MaE 311)

PHY 351. QUANTUM MECHANICS **Three credits**

An introduction to quantum mechanics. Schrodinger's equation and its application to the potential-well, the harmonic oscillator, and the hydrogen atom. Angular momentum. Perturbation theory. Identical particles; Pauli's exclusion principle. The Dirac relativistic wave equation and the origin of electron spin.

PHY 361/363. ATOMIC PHYSICS/LAB **Four credits**

Planck's theory of cavity radiation, photons and the particle aspect of radiation, the wave-like properties of particles. Schrodinger's theory of quantum mechanics, one-electron atom, special functions, use of recursion relations to evaluate selection rules, x-ray and optical excitations of multi-electron atoms, application of group theory to the normal modes of molecules, quantum statistics with simple applications to solids. Fee: $35.

PHY 370. INTRODUCTION TO SOLID STATE PHYSICS **Three credits**

Introduction to bonding and crystal structure, symmetry, considerations, reciprocal lattice considerations, lattice dynamics, electronic structure of simple metals, insulators, and semiconductors, dielectric, ferroelectric, and magnetic properties of materials.

PHY 380/382. NUCLEAR PHYSICS/LAB **Four credits**

Some properties of nuclei: size, density, shape; the nuclear force; models of nuclear structure, unstable nuclei; radioactive decay, alpha decay, Gamow's theory; Beta decay; Fermi's theory; Gamma decay and the Mossbauer Effect; nuclear reactions, the excited states of nuclei; fisson and reactors; fusion, the origin of the chemical elements, elementary particles; unification. Fee: $35.

PHY 398. TOPICS IN PHYSICS **Three credits**

Selected topics in physics. May be repeated for credit.

CS 364. NUMERICAL ANALYSIS **Three credits**

Numerical methods of differentiation, integration, solution of equations and of differential equations with emphasis on problems that lend themselves to solution using computers. (Same as Mth 364)

EE 342. MICROCOMPUTER OPERATION AND DESIGN **Three credits**

Microprocessor architecture, microcomputer design, and peripheral interfacing. Microprogramming, software systems, and representative applications. Associated laboratory experiments consider topics as bus structure, programming, data conversion, interfacing, data acquisition, and computer control. Two hours lecture and one two-hour laboratory a week. Fee: $35. (Same as CS 329)

EE 381. ADVANCED MICROELECTRONICS LAB **Four credits**

The theoretical and practical aspects of techniques utilized in the fabrication of semiconductor devices. Crystal growth, solid solubility, alloying and diffusion, oxide masking and epitaxy. Thin and thick film techniques. Device fabrication procedures in microelectronics, and the electrical performance of devices based on these techniques. Ion implantation systems and method of fabrication. One hour lecture and one six-hour laboratory a week. Fee: $35.

EE 382. ADVANCED COMMUNICATION LAB **Four credits**

Characterization and measurement of microwave components, devices, and systems. Emphasis on testing and design criteria using swept frequency and dynamic techniques. Network and spectrum analyzers. Antenna radiation pattern measurements using the antenna range test facility. Microwave communication link design and testing. CAD utilization in MW systems. Coherent optical wave generation and modulation. Laser communication. One hour lecture and one six-hour laboratory a week. Fee: $35.

EE 398. TOPICS IN ELECTRICAL ENGINEERING **Three credits**

Selected topics in electrical engineering. May be repeated for credit.

MaE 398. TOPICS IN MATERIALS ENGINEERING **Three credits**

Selected topics in materials engineering. May be repeated for credit.

400-Level Courses

EGR 400. ETHICS IN SCIENCE AND ENGINEERING **Three credits**

Ethical problems of scientists and technologists with an emphasis on modern case histories. The responsibilities and protections of professional status and the role of professional societies. Acceptable behavior: insider and outsider views.

PHY 401. ANALYSIS **Three credits**

The analysis of some physical and abstract problems using well-developed mathematical techniques such as contour integration, integral transforms, matrices, Bessel, Legendre, or Laguerre polynomials, FFT's difference equations and numerical methods. (Same as EE 401)

CORE course.

PHY 410. LINEAR SYSTEM THEORY **Three credits**

Linear spaces and linear operators; input-output systems and state variables; linear dynamical equations and impulse response matrices; controllability, observability and their applications to minimal realizations; state feedback controllers and observers; multivariable systems. (Same as EE 410)

Prerequisite: EE 214.

PHY 411. ANALYTICAL MECHANICS **Three credits**

Variational principles and Hamiltonian theory. Cannonical transformations and Gauge invariance. Descriptions of rigid body motions or other applications.

PHY 425. ENERGY SYSTEMS **Three credits**

The analysis of the conversion and transfer of energy in various systems of technical or scientific interest. High and low power density systems. Up and down scaling. Heat transfer and storage. Entropy considerations.

PHY 427. SOLID STATE DEVICES **Three credits**

Transistor processes and types. Properties of semiconductors and junctions. High current effects and low frequency feedback effects. Low and high frequency hybrid parameters.

PHY 432. ELECTROMAGNETIC FIELDS AND WAVES **Three credits**

Maxwell's equations. Energy and momentum in the electromagnetic field. Plane, cylindrical, and spherical waves. Boundary conditions. Cylindrical waveguides, cavity resonators and scattering by a sphere and other geometries. (Same as EE 432.)

CORE course.

PHY 435. LASER AND DEVICE OPTICS **Three credits**

Gaussian beam optics. Non-linear optical effects; frequency doubling; lasing. Wave guiding in the double heterostructure diode laser. IR and visible diode lasers. Spectral control. Comparison of gain-guided and real refractive index lasers. Construction details and the dynamics response of pulsed lasers.

PHY 452. QUANTUM MECHANICS **Three credits**

Review of the important concepts and tools of quantum mechanics. Dirac notation, linear operators and unitarity. The Postulates. Bound and unbound states, unstable states. Gauge invariance. The harmonic oscillator and phonons. The central potential and hydrogen-like systems. Applications.

CORE course.

PHY 480. NUCLEAR AND HIGH ENERGY PHYSICS **Three credits**

Nuclear size and shapes. Radioactive decay. Alpha and Gamma emission. The Fermi theory of Beta decay. Nuclear reactions and subnuclear particles. Classification. Two nucleon interactions. Collective interactions.

PHY 491. PRACTICUM **Three to six credits**

PHY 498. TOPICS IN PHYSICS **One to three credits**

Topics dependent on interest and need. May be repeated for credit.

500-Level Courses

PHY 514. OPTIMAL CONTROL THEORY **Three credits**

The calculus of variations and the minimum principle; optimal control of discrete-time systems; optimal control of continuous-time systems; dynamic programming; models of dynamic systems; optimal estimation; stochastic neighboring optimal control. (Same as EE 514)

Prerequisite: EE 410.

PHY 530. ELECTRODYNAMICS AND RELATIVITY **Three credits**

The Lorentz transformation. The electromagnetic field tensor and covariance. Radiation and plasma dynamics; interactions of electromagnetic waves with matter.

PHY 535. LIGHT SCATTERING **Three credits**

Classical and quantum descriptions of light scattering including Rayleigh scattering, Brillouin scattering and Raman scattering. Scattering in crystals and glasses. Stimulated and spontaneous emission. Coherence and resonance effects.

PHY 540. STATISTICAL MECHANICS AND TRANSPORT THEORY **Three credits**

Review of thermodynamic concepts; the partition function and phase space. The Einstein model and the Debye model for a crystalline solid. Bose-Einstein and Fermi-Dirac statistics. Random processes and irreversible thermodynamics. Noise and fluctuations. The Onsager relations. The Boltzman transport equation.

PHY 550. ADVANCED QUANTUM MECHANICS **Three credits**

Scattering and scattering cross sections, partial wave analysis; applications. Angular momentum and Clebsch-Gordon coefficients. Stationary perturbation theory; time-dependent perturbation theory; resonant perturbations and the decay or resonantly coupled states.

PHY 571. THEORY OF SOLIDS **Three credits**

Energy band calculations. Phonons and other elementary excitations. Superconductivity, cooperative phenomena, order-disorder transitions.

PHY 580. NUCLEAR PROCESSES **Three credits**

Nuclear systems for power generation and other applications. Nuclear waste. Comparison of fossil fuel, and several fission schemes. Fusion schemes.

PHY 590. THESIS **One to three credits**

PHY 598. ADVANCED TOPICS IN PHYSICS **Three credits**

Topics dependent on interest and need. May be repeated for credit.

Master of Science in Education with a program in Secondary Education/Physics

ADMISSION

For admission to the graduate study in Secondary Education/Physics, the applicant should possess an undergraduate degree in physics or in any other related science, mathematics, or engineering area.

DEGREE REQUIREMENTS

General requirements for the Master of Science in Education with a program in Secondary Education/Physics listed under Education on page 34. Specific physics requirements consist of eighteen graduate credits chosen in consultation with the student's advisor in the Physics Department. As a general rule, any course numbered at a 300-level or above may be taken for graduate credit. (See the current undergraduate BULLETIN for a complete list of 300-level physics courses. 400-level and 500-level physics courses are listed above.)

Earth and Environmental Sciences

James J. Bohning, (Ph.D.) *Chairperson*

These courses may be taken by special students or may be applied towards graduate degrees offered by other departments. Students planning to apply these credits towards degree programs should secure the approval of their academic advisor prior to inclusion in their course of study.

COURSES OF INSTRUCTION

EARTH & ENVIRONMENTAL SCIENCES 491. PRACTICUM Three to six credits

EARTH & ENVIRONMENTAL SCIENCES 498.
ADVANCED TOPICS I & II One to three credits each

Selected topics covering a variety of atmospheric, hydrospheric, and lithospheric processes and environmental management issues. May be repeated for credit.

Prerequisite: Senior or graduate standing.

FACULTY COMMITTEE ON GRADUATE STUDIES

Mahmoud H. Fahmy	Dean of Graduate Studies and Adult Education Professor of Education Ph.D. (Syracuse)
Michael W. Heikkinen	Professor of Education Ph.D. (Idaho)
Merle J. Peper	Associate Professor of Business Administration Ph.D. (Louisiana State)
Mary Ann Saueraker	Assistant Professor of Nursing M.S. (Pennsylvania State)
Richard E. Sours	Professor of Mathematics/Computer Science Ph.D. (Virginia)
Sharon G. Telban	Associate Professor of Nursing M.S. (Wilkes) M.S. (Pennsylvania State)
George W. Waldner	Vice President for Academic Affairs Ph.D. (Princeton)

Please send this form to:

Dr. Mahmoud H. Fahmy, *Dean*
Division of Graduate Studies
and Adult Education
WILKES UNIVERSITY
Wilkes-Barre, PA 18766

Wilkes does not discriminate on the basis of race, color, national or ethnic origin, or handicap in the administration of its educational programs and activities in accordance with applicable federal statutes and regulations. Inquiries concerning application to this policy should be directed to the Affirmative Action Officer.

Additional space for recommendation

Name | Title | Address

APPLICATIONS WILL NOT BE PROCESSED UNTIL ALL SUPPORTING PAPERS ARE RECEIVED. THESE INCLUDE:

1. Official transcripts of all college work, graduate and undergraduate.
2. Two letters of recommendation.
3. TOEFL Scores for all foreign students whose native language is not English.
4. $25.00 Application fee (non-refundable).

Intelligence						
Originality & Creativity						
Motivation & Perseverance toward goals						
Maturity						
Ability to work independently						
Overall potential for graduate study						

Please send this form to:

Dr. Mahmoud H. Fahmy, *Dean*
Division of Graduate Studies
and Adult Education
WILKES UNIVERSITY
Wilkes-Barre, PA 18766

RECOMMENDATION FORM
WILKES

Division of Graduate Studies and Adult Education

Name of applicant_____

Graduate Program desired_____

Family Education Rights and Privacy Act (FERPA)
(Buckley Amendment)

Under the provision of this Act you have the right, if you enroll in Wilkes, to review your education record. The Act further provides that you may waive your right to see recommendations for admission. Please indicate below, by circling the appropriate phrase and signing your name, whether or not you wish to waive that right.

I waive do not waive any right that I have to this recommendation form.

_____ _____
Applicant's signature Date

To person completing this recommendation:
Your assessment of the candidate's potential for graduate work is desired. Use reverse side if additional space is required.
Please evaluate the applicant on the scale below in comparison with others you have known during your professional career.

	Top 10% Outstanding	Top 20% Superior	Top Third Above Average	Middle Third Average	Bottom Third Below Average	Unable to Judge
Intelligence						
Originality & Creativity						
Motivation & Perseverance toward goals						
Maturity						
Ability to work independently						
Overall potential for graduate study						

_____
Name of Respondent (type or print)

_____
Position or Title

Telephone_____

Address_____

_____

Signature of Respondent_____ Date_____

Highly Recommend ☐ Recommend ☐ Recommend with reservation ☐ Not recommended ☐

_____

Date admission is desired:
☐ Fall ☐ Spring ☐ Summer 199___

Occupation:_____

Employment record:

Company or school system	Duties	Dates

Letters of recommendation will be furnished from the following. Two are required, one of which may be from an Academic Dean or Faculty member at the academic institution attended, or a supervisor from place of employment.

Name	Title	Address

APPLICATIONS WILL NOT BE PROCESSED UNTIL ALL SUPPORTING PAPERS ARE RECEIVED.
THESE INCLUDE:

1. Official transcripts of all college work, graduate and undergraduate.
2. Two letters of recommendation.
3. TOEFL Scores for all foreign students whose native language is not English.
4. $25.00 Application fee (non-refundable).

Do you desire on-campus accommodations? ☐ Yes ☐ No

Are you interested in applying for a position as a Resident Assistant? ☐ Yes ☐ No

Are you requesting financial assistance? ☐ Yes ☐ No

Applicant's signature_____ Date _____

DO NOT WRITE BELOW THIS LINE

Application fee received_____ Date _____

Transcripts complete_____ Date _____

Recommendation received_____ Date _____

Recommendation received_____ Date _____

GMAT, GRE, Miller Analogies (if applicable) received_____ Date _____

Statement of Professional Goals (if applicable) received_____ Date _____

TOEFL received (if applicable)_____ Date _____

Affidavit of Support (if applicable)_____ Date _____

Application forwarded to department_____ Date _____

Admission type_____ Date _____

V.A. identification (if applicable)_____

An equal opportunity/affirmative action institution

RECOMMENDATION FORM
WILKES

Division of Graduate Studies and Adult Education

Name of applicant_____

Graduate Program desired_____

Family Education Rights and Privacy Act (FERPA)
(Buckley Amendment)

Under the provision of this Act you have the right, if you enroll in Wilkes, to review your education record. The Act further provides that you may waive your right to see recommendations for admission. Please indicate below, by circling the appropriate phrase and signing your name, whether or not you wish to waive that right.

I waive do not waive any right that I have to this recommendation form.

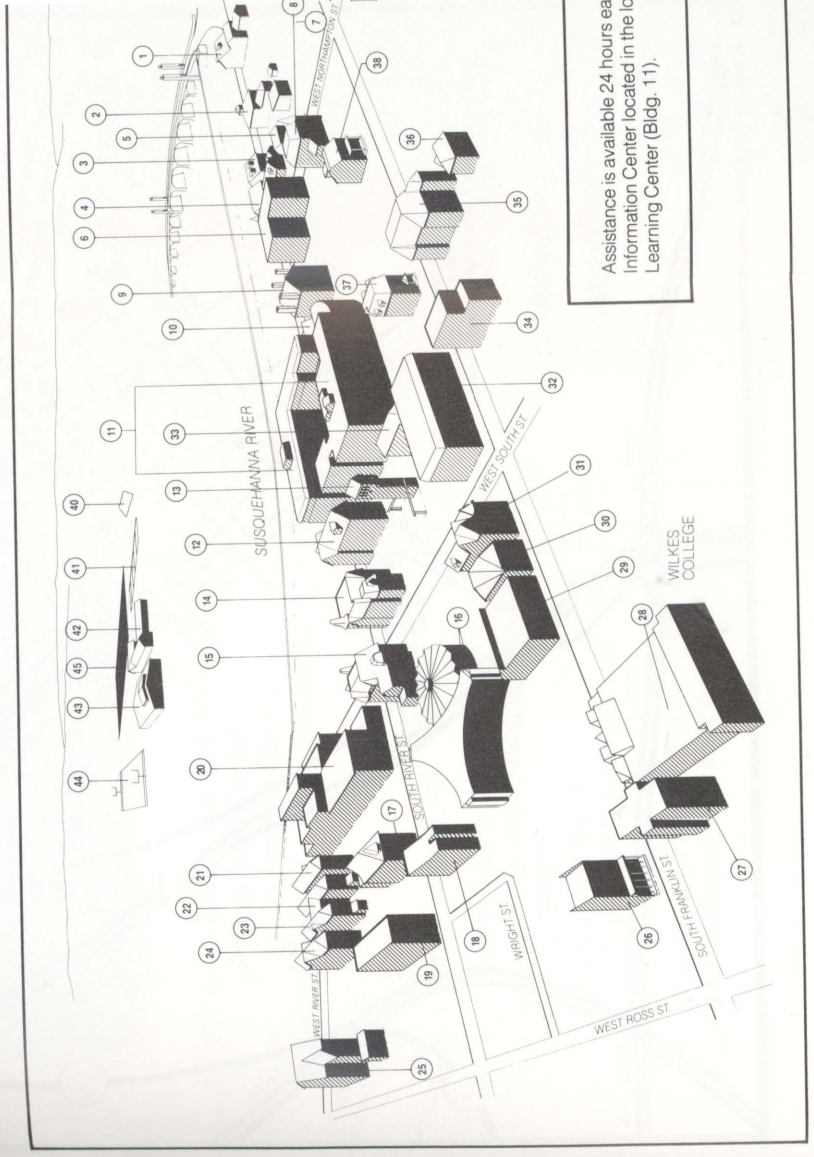
Applicant's signature _____ Date _____

To person completing this recommendation:
Your assessment of the candidate's potential for graduate work is desired. Use reverse side if additional space is required.
Please evaluate the applicant on the scale below in comparison with others you have known during your professional career.

Top 10% Outstanding	Top 20% Superior	Top Third Above Average	Middle Third Average	Bottom Third Below Average	Unable to Judge

WHERE THEY ARE

ABM Maintenance
R. 98 S. River St.
Academic Affairs
Weckesser Hall
Accounts Payable
Sturdevant Hall
Act 101
Kirby Hall
Admissions Office
Chase Hall
Alumni Office
Evans Alumni House
Amnicola Office
Student Center
Apple Lab
Stark Learning Center
Art Department
Bedford Hall
Athletic Department
Weckesser Annex
Athletic Facilities
Ralston Field
Beacon
Student Center
Biology Department
Stark Learning Center
Bookstore
Church Hall
Campus Information
Stark Learning Center
First Floor Lobby
Career Services
Max Roth Center
Center for the Performing Arts
W. River & South Street
Center for Regional Development
Hollenback Hall
Chemistry Laboratories
Stark Learning Center
College Development
Weckesser Hall
College of Arts & Sciences
Capin Hall
Communications Technician
Stark Learning Center
Community Relations
Weckesser Hall
Commuter Council
Student Center
Computer Support Center
Stark Learning Center
Continuing Education
Max Roth Center
Cooperative Education
Max Roth Center
Counseling Services
136 S. Franklin St.
Debate Union
Capin Hall
Development Office
Weckesser Hall
Earth & Environmental Sciences
Stark Learning Center
Education Department
Stark Learning Center
Engineering Department
Stark Learning Center
Engineering Technicians
Stark Learning Center
Evening, Summer, Weekend Programs
Max Roth Center
Faculty Lounge
Evans Alumni House
Field House
Ralston Field
Financial Management Office
Sturdevant Hall
Financial Aide Office
Sturdevant Hall
Food Service/Cafeteria
Pickering Hall
Foundations & Grants Management
Weckesser Hall
Graduate S
Max Roth
Health Scie
Hollenbac
Health Serv
136 S. Fra
History & P
Capin Hal
Human Res
Weckesse
Institute of
Hollenbac
Institutiona
Weckesse
Inter-Resid
Student C
Language &
Kirby Hall
Learning Ce
Kirby Hall
Mathematic
Stark Lear
Media Cent
Library
Music Depa
Darte Cen



Assistance is available 24 hours ea
Information Center located in the lo
Learning Center (Bldg. 11).

WILKES UNIVERSITY
GRADUATE DIVISION

APPLICATION FOR ADMISSION

Please print or type the information requested below and return it with a non-refundable processing fee of $25.00.
Please make check payable to Wilkes.

Name_____
Last First Middle (Maiden)

Home address_____
No. Street City State Zip

Mailing address (if different)_____
No. Street City State Zip

Home Telephone_____ Business Telephone_____

Sex_____ Birth Date_____ Social Security No._____

Citizen of (indicate country)_____. Are you a veteran?_____. VA benefits?_____.

Information contained in this box is not used for admission purposes, but is used for statistical reporting to state and federal agencies. At your option please indicate the following:

Racial Ethnic Group:
☐ White not Hispanic ☐ Black not Hispanic ☐ Hispanic
☐ American Indian or ☐ Alaskan Native ☐ Asian or Pacific Islander

Name of high school_____ Date of graduation_____

Colleges or universities attended:

Name_____ Dates_____ Degree_____

Name_____ Dates_____ Degree_____

Name_____ Dates_____ Degree_____

Major area of undergraduate study_____

Check status desired: ☐ Degree Program ☐ Special non-degree

Check enrollment desired: ☐ Part-time ☐ Full-time

Check program desired:

☐ Master of Business Administration
Concentration:_____
☐ Master of Health Administration
☐ Master of Science with Major in Nursing
Clinical Focus: Gerontology
Functional Areas:
Administration ____
Education ____
Practice ____

Education Students: ☐ Certified to teach
☐ Not certified

☐ Master of Science in Education Programs: (check one)
Education ____
Elementary Education ____
Secondary Education/Biology ____
Secondary Education/Chemistry ____
Secondary Education/English ____
Secondary Education/History ____
Secondary Education/Mathematics ____
Secondary Education/Physics ____
Options: Educational Computing ____
Educational Development and Strategies ____
☐ Master of Science in Electrical Engineering
☐ Master of Science in Mathematics
☐ Master of Science in Physics

WHERE THEY ARE

ABM Maintenance
R. 98 S. River St.
Academic Affairs
Weckesser Hall
Accounts Payable
Sturdevant Hall
Act 101
Kirby Hall
Admissions Office
Chase Hall
Alumni Office
Evans Alumni House
Amnicola Office
Student Center
Apple Lab
Stark Learning Center
Art Department
Bedford Hall
Athletic Department
Weckesser Annex
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Hollenback Hall
Chemistry Laboratories
Stark Learning Center
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Capin Hall
Communications Technician
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Weckesser Hall
Commuter Council
Student Center
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Continuing Education
Max Roth Center
Cooperative Education
Max Roth Center
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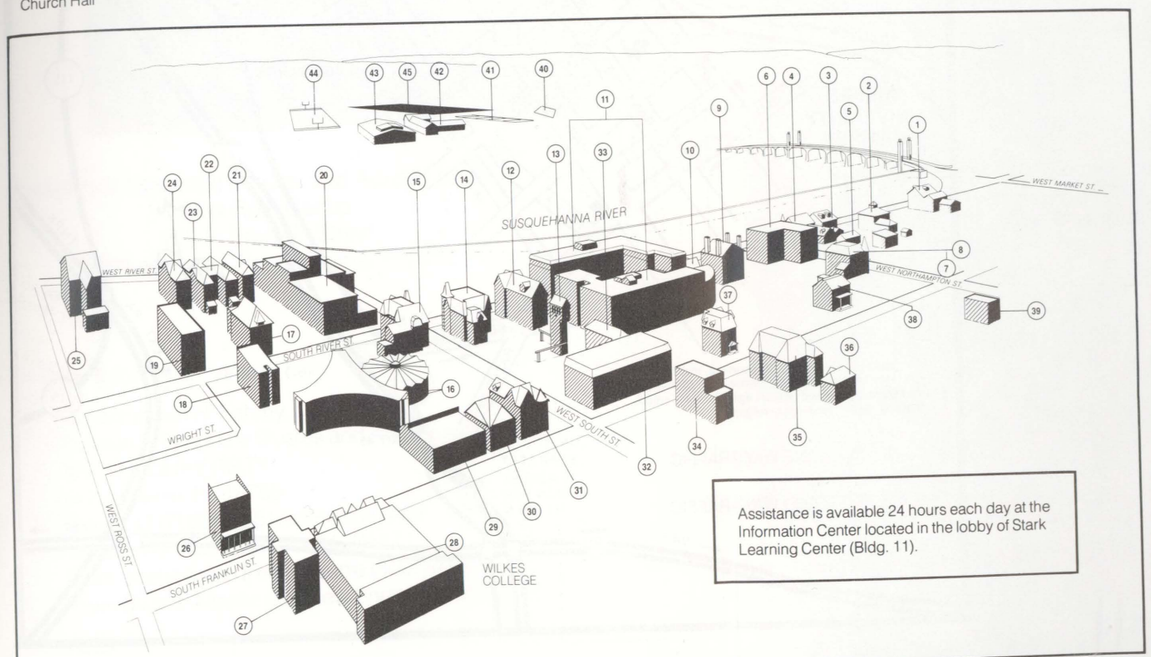
136 S. Franklin St.
Debate Union
Capin Hall
Development Office
Weckesser Hall
Earth & Environmental Sciences
Stark Learning Center
Education Department
Stark Learning Center
Engineering Department
Stark Learning Center
Engineering Technicians
Stark Learning Center
Evening, Summer, Weekend Programs
Max Roth Center
Faculty Lounge
Evans Alumni House
Field House
Ralston Field
Financial Management Office
Sturdevant Hall
Financial Aide Office
Sturdevant Hall
Food Service/Cafeteria
Pickering Hall
Foundations & Grants Management
Weckesser Hall
Graduate Studies
Max Roth Center
Health Sciences Program
Hollenback Hall
Health Services
136 S. Franklin St.
History & Political Science Dept.
Capin Hall
Human Resources Management
Weckesser Hall
Institute of Regional Affairs
Hollenback Hall
Institutional Research
Weckesser Hall
Inter-Residence Hall Council
Student Center
Language & Literature Dept.
Kirby Hall
Learning Center
Kirby Hall
Mathematics Department
Stark Learning Center
Media Center
Library
Music Department
Darte Center for the Performing Arts
Nursing Laboratory
Stark Learning Center
Philosophy Department
Bedford Hall
Physics Department
Stark Learning Center
President's Office
Weckesser Hall
Printing Center
Weckesser Hall
Psychology Department
Stark Learning Center
Public Relations Office
Weckesser Hall
Purchasing Office
Sturdevant Hall
Receiving & Shipping
Pickering Hall
Recorder
Sturdevant Hall
Regional Computer Resource Center
Stark Learning Center
Registrar
Sturdevant Hall
Residence Life Office
Pickering Hall
ROTC
Slocum Hall
School of Business & Economics
Fortinsky Hall
School of Engineering & Physical Sciences
Stark Learning Center
Security
Stark Learning Center
Small Business Development Center
Hollenback Hall
Sociology Department
Chase Hall
Sordoni Art Gallery
Stark Learning Center
Sports Information
Arnaud C. Marts Center
Student Affairs
Conyngham Student Center
Student Center Office
Conyngham Student Center
Student Government
Conyngham Student Center
Summer School Office
Max Roth Center
Testing Services
Chase Hall
Theater Department/Box Office
Center for the Performing Arts
Upward Bound
Sturdevant Hall
Veterans' Affairs Office
Sturdevant Hall
WCLH Radio
Darte Center for the Performing Arts
Weekender Program
Max Roth Center
Word Processing Center
Weckesser Hall
Writing Laboratory
Kirby Hall



Assistance is available 24 hours each day at the Information Center located in the lobby of Stark Learning Center (Bldg. 11).

WILKES UNIVERSITY
GRADUATE DIVISION

APPLICATION FOR ADMISSION

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☐ American Indian or ☐ Alaskan Native ☐ Asian or Pacific Islander

Name of high school_____ Date of graduation_____

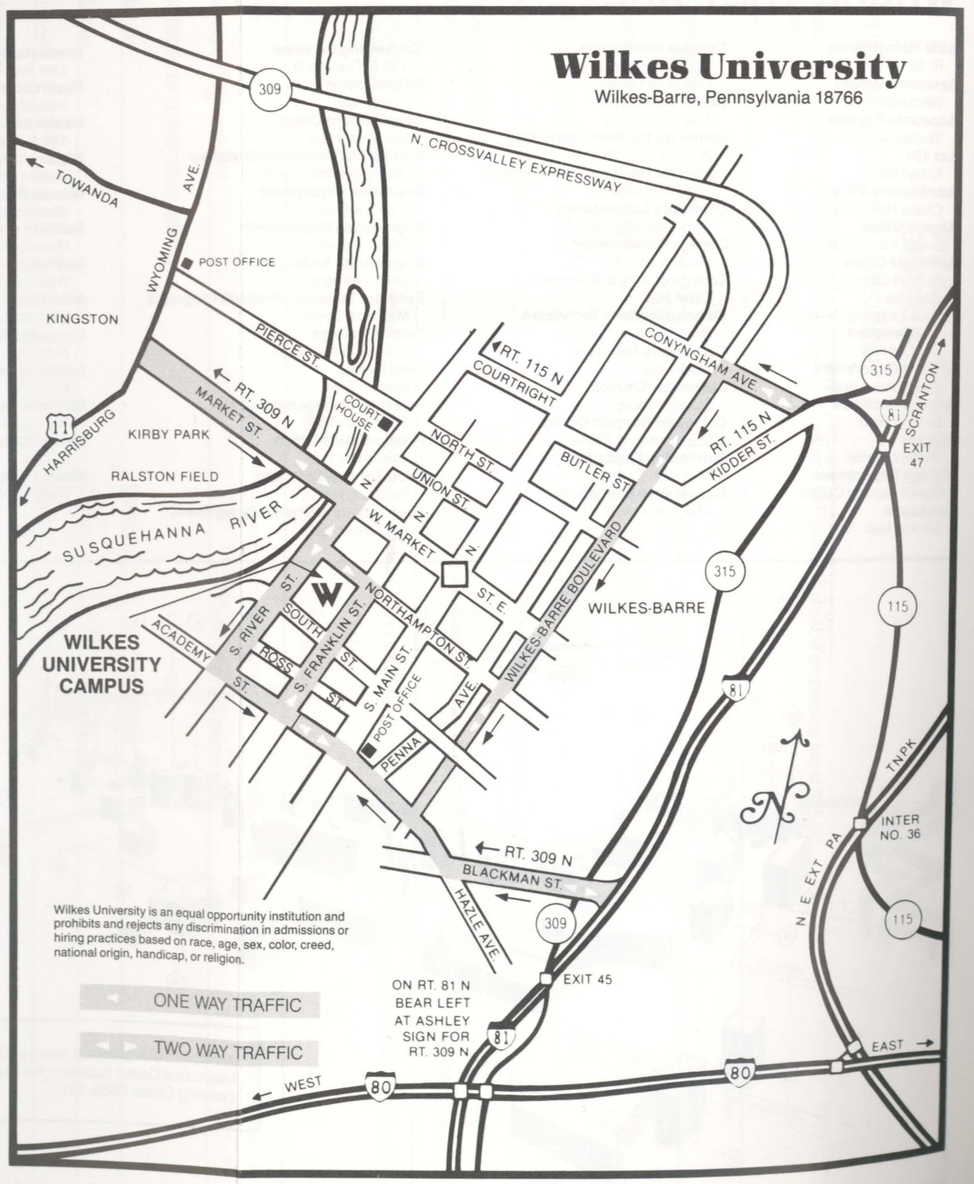
Colleges or universities attended:

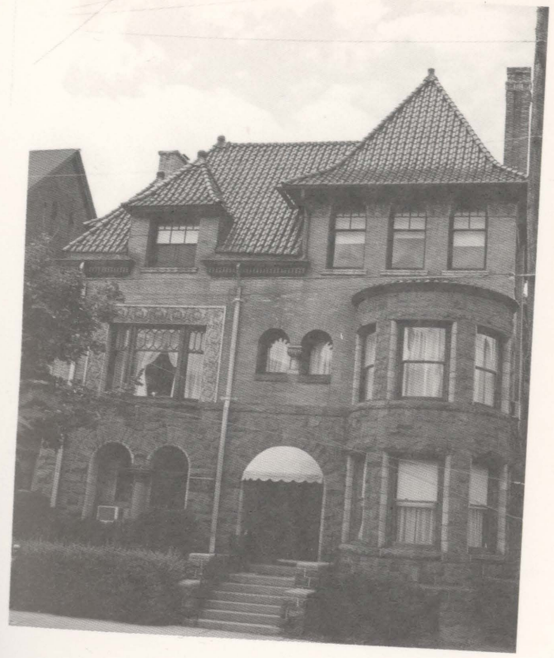
Name_____ Dates_____ Degree_____

Name_____ Dates_____ Degree_____

WHAT THEY ARE

1. **McClintock Hall,** 44 S. River St.
2. **Sterling Hall,** 72 S. River St.
3. **Catlin Hall,** 92 S. River St.
4. **Weiss Hall,** 98 S. River St.
5. **Maintenance Office,** R. 98 S. River St.
6. **William L. Evans Hall,** 110 S. River St. (P)
7. **Chesapeake Hall,** 68-70 W. Northampton St.
8. **Delaware Hall,** 72-74 W. Northampton St.
9. **Conyngham Student Center**
10. **Annette Evans Alumni & Faculty House,** 146 S. River St.
11. **Stark Learning Center,** 150-180 S. River St.
12. **Chase Hall,** 184 S. River St. (P)
13. **Burns Alumni Bell Tower & Carrilion**
14. **Kirby Hall,** 202 S. River St.
15. **Bedford Hall,** 96 W. South St. (P)
16. **Pickering Hall & College Dining Hall,** Wright St. (P)
17. **Ross Hall,** 251 S. River St.
18. **Slocum Hall,** 262-264 S. River St.
19. **Sullivan Hall,** 271-273 S. River St.
20. **Darte Center for the Performing Arts,** South & S. River Sts.
21. **President's Residence,** 30 W. River St.
22. **Waller Hall North,** 36 W. River St.
23. **Waller Hall South,** 40 West River Street
24. **Doane Hall,** 56 W. River St.
25. **Barre Hall,** 80 W. River Street
26. **Dennison Hall,** 285-287 S. Franklin St.
27. 280 S. Franklin St.
28. **Arnaud C. Marts Center,** 274 S. Franklin St.
29. **Fortinsky Hall,** 225-227 S. Franklin St.
30. **Nursing Building,** 219 S. Franklin St.
31. **Max Roth Center,** 215 S. Franklin St.
32. **Eugene S. Farley Library,** S. Franklin & W. South Sts.
33. **Church Hall,** 187 S. Franklin St.
34. **Hollenback Hall,** 192 S. Franklin St.
35. **Weckesser Hall,** 170 S. Franklin St. (P)
36. **Weckesser Annex,** R. 170 S. Franklin St.
37. **Capin Hall,** 165 S. Franklin St. (P)
38. **Sturdevant Hall,** 129-131 S. Franklin St. (P)
39. **Miner Hall** (YMCA)
40. **Baseball Field** (P)
41. **Tennis Courts** (P)
42. **Field House**
43. **McBride Fieldhouse** (P)
44. **Ralston Field**
45. **Ralston Field Parking Area**





Division of Graduate Studies and Adult Education
Max Roth Center
215 S. Franklin Street
Wilkes-Barre, Pennsylvania 18766

For further information, write or call:

Dr. Mahmoud H. Fahmy, *Dean*
Division of Graduate Studies and Adult Education
WILKES UNIVERSITY
Wilkes-Barre, PA 18766
Phone: (717) 824-4651, extension 4462
Toll-free from Scranton, PA 342-5617
From elsewhere in Pennsylvania (800) 572-4444
From Middle-Atlantic and New England Regions (800) 537-4444

Wilkes-Barre, PA 18766
(717) 824-4651