

## Graduate Studies <br> FALL 1987 (TIMES IN LIGHT FACE REPRESENT and TIMES IN BOLD FACE P.M.)

Description $\quad$ Room Day \& Hour Instructor Credit

COLLEGE OF ARTS AND SCIENCES

BIOLOGY
(Prereq: Bio 121 -122 or permission of instructa) Bot
Bio 303G A1 Laboratory SLC 305 T 2-4.50 Botier
(Lab Fee \$35)
$\qquad$
SLC 305 T 2-4:50

## ootjer

Bio 315G A Motalar Biology
SLC 359 M WF 10-10:50 Turoczi
3
Bio 318G A Developmental Biology SLC 359 M W F 1-1:50 Developmental Biology

Bio 320 G A (Prerea: Bio 121-122, 223-224

SLC 359 M W F

| Bio 320G A1 | (Prereq: Bio 121-122, 223-224 or permission of instructor) <br> Laboratory <br> (Lab Fee \$35) | SLC 349 | W 2-4:50 | Klemow |
| :--- | :--- | :--- | :--- | :--- |
| Bio 340G A | Limnology | SLC 359 | TTh 1-1:50 | Houseknecht | 3

Bio 340G A1 | Laboratory |
| :---: |
| $(\mathrm{LabFee} 535)$ |$\quad$ SLC 377 Th 2-2:50 Houseknecht

(Lab Fee \$35)


Chem 361GA Biochemistryl
SLC 204 M W F 9.9:50 W. R. Stine
(Prerea: Chem 232)
SCHOOL OF BUSINESS AND ECONOMICS
business administration
ACCT 501E Financial \& Managerial DDD 201 T 6-9 Croop 3 Accounting
rereq: ACCT 101 \& 102,
(Formerly ACCT 503 Managerial Accounting)
ACCT 595E Independent Research
BA 502 E1 Management Science
(Prerea: Computer Science)
Management Science
(Prereq: Computer Science)
BA 508E Management Information SLC 270 Th 6-9 Penugonda 3 Systems
(Prereq: Admission to the MBA Program or permission of the School of
Business and
Business and Economics. No computer programming background is assumed
BA511E Modern International BDF 13 T 6-9 Taylor

- Commerce

Human Behavior \& Marketing SLC 342 Th 6-9 Batory 3
BA 521E Organizational Theory SLC 204 Th 6-9 Raspen
BA 550 E1 Topics: Small Business $\quad$ To Be Arranged Chmiola 3
BA 550 E2 Topics: Regional Economic KBY 302 W 6-9 Grossman Development
$\begin{array}{llrlll}\text { BA 553 E } & \text { Financial Markets \& Inst. } & \text { DDD 202 } & \text { M 6-9 } & \text { Engel } & 3 \\ \text { BA } 557 \mathrm{E} & \text { Pension Administration } & \text { BDF 12 } & \text { Th 6-9 } & \text { Farrar } & 3\end{array}$
BA 595 E Independent Research
To Be Arranged Staff
ECONOMICS
$\begin{array}{ll}\text { EC 505E } & \begin{array}{l}\text { Managerial Statistics } \\ \text { (Pereq: EC 231) }\end{array} \\ \text { EC 510E } & \text { Managerial Economics }\end{array}$
BDF 13 M 6-9
DDF 13 W 6-9 Williams
EDUCATION
ED 510GE Psychological Foundations SLC 311 T 6-9 Ginsburg 3
ED 511E Philosophical Foundations TBA Williams of Education

| Dates: | Times: |
| :--- | :--- |
| September 25, 26 | Fridays: |
| October 9,10 | $\mathbf{7 - 1 0}$ |
| October 23,24 | Saturdays: |
| November 13,14 | $\mathbf{9 - 4}$ |

ED 532GE Problems in Elem Ed SLC 311 W 6-9 anguage Arts SLC Rm. 1 W6-9 Ginsburg

ED 534GE Elem. Ed. School Curriculum SLC 409 T 6-9 Darte
ED 536GE Elem. School Reading SLC 160 M W 4-5:15 Fremont
ED 541GE $\quad$ Secondary School Curriculum SLC 409 T 6-9 Darte 3
ED 550G Project T.E.A.C.H. TBA TBA Staff 3
$\begin{array}{lllll}\text { ED 551G } & \text { P.R.I.D.E. } & \text { TBA TBA } & \text { Staff } & 3 \\ \text { ED552G } & \text { Teaching Through Learning } & \text { TBA TBA } & \text { Staff } & 3\end{array}$
ED 583GE $\begin{aligned} & \text { Machine Language } \\ & \text { (Prereq: One course in high-level language) }\end{aligned}$ SLC 318 M 6-9 Pryor 3
EDUCATION COURSES WITH SPECIAL INTEREST
ED 533 B Problems in Elementary SLC 150 M 6-9 Placek 3 Education Science (PIES) Computer Literacy for SLC 127 W6 6-9 3 Elementary Teachers $\begin{array}{llll}\text { Computer Literacy for SLC } 127 & \text { T 6-9 } & \text { Bellucci }\end{array}$ Secondary Guidance Microcomputers in Education SLC 127 M 6-9 (CORES II)

Course Description
Room Day \& Hour
Instructor Credit

## SCHOOL OF ENGINEERING AND PHYSICAL SCIENCES

ELECTRICAL ENGINEERING
(Courses Applicable to the MSEE Degree)
EE 335 A
EE 335 E (Prereq: EE 332) $\quad$ SLC 405 TTh 6:30-9:50 Janaswamy 3
Microwaves \& Antenna SLC 405 TTh 6:30-9:50 Janaswamy 3 (Prereq: EE 332)
EE 361 A Communication Systems
SLC 147 M WF
12-12:50 Yeroushalmi 3
SLC 147 MWF 11-11:50 Bellas
EE 401 A Analysis SLC 342 TTh 2:30-3:45 Staff
EE 447 A Computers, Systems \& Devices SLC 411 TTh 6:30-7:45 Mohseni 3
EE 481E $\begin{aligned} & \text { Semiconductors Fabrication } \\ & \text { Lab }\end{aligned} \quad$ SLC 22 M 5-11 Osadchy 3.
EE 505A Remote Sensing SLC 209 M W 2:30-5:45 Armand 3
PHYSICS
(Courses Applicable to the MS Physics Degree)

PHY 301 A $\quad$| Math Methods in Physics I SLC 147 T Th 8-9:30 Bellas |
| :---: |
| (Preeq MTH 2118 |

PHY 323 E $\quad$-Ray Diffraction
PHY 3231 Laboratory
$\begin{array}{llrll}\text { PHY 351 A } & \begin{array}{l}\text { Quantum Mechanics } \\ \text { (Prereq: PHY 301 \& 310) }\end{array} & \text { SLC } 147 \text { M W F F 11-11:50 Bellas } & 3 \\ \text { PHY 380 A } & \text { Nuclear Physics } & \text { SLC 42 } & \text { MWF 12-12:50 } & \text { Maxwell }\end{array}$


PHYSICS
(Courses Applicable to the MS Education Degree)
To satisfy the physics concentration component of this degree, students may choose from currently offered physics courses numbered at the $300-$-level or above. An advisor in the physics department must be consulted.
ENGLISH
ENG 310G A Medieval English Literature SLC 160 MTTh 10-10:50 Fiester 3 ENG 325G A Shakespeare SLC 209 TTh 1-2:15 Kaska 3 NG 345G A (Prereq: ENG 152 or 254) KBY 302 MWF 2-2:50 Tery ENG 370GA Modern British Poetry KBY 102 TTh 2:30-3:15 Gutin 3
HEALTH SERVICE ADMINISTRATION (MHA)

| HSA 500 E | National Health Policy | SLC 359 T 6-9 | Healey | 3 |
| :---: | :---: | :---: | :---: | :---: |
| HSA 501E | Leadership \& Human | SLC 342 W 6-9 | Livingstone | 3 |
| HSA 503E | Health Economics (Prereq: ECON 102 Micro Theory) | SLC 359 M 6-9 | Healey | 3 |
| HSA 511E | Perspectives on Aging | SLC 359 Th 6-9 | Telban | 3 |
| HSA 530 E | Financing Health Care | SLC 160 T 6-9 | Menichello | 3 |
| HSA 540E | Labor/Management Relations | SLC 160 Th 6-9 | Livingstone | 3 |
| HSA 550 E2 | Topics: Epidemiology | SLC 359 W 6-9 | Houseknecht | 3 |
| HSA 550 E1 | Alcohol \& Substance Abuse | SLC 342 <br> September 11, 12 <br> October 2, 3 <br> October 30, 31 <br> November 13, 14 <br> November 27,28 | Ambrosino <br> Weekends: <br> Fridays: <br> 6-9 <br> Saturdays: <br> 9.4 | 3 |

HISTORY/POLITICAL SCIENCE

| HST 334 E | The United States 1900-1945 | Capin 15 | T 6:30-9:30 | Rodechko | 3 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| HST 335 E | The United States since 1945 | Capin 15 | M 6:30-9:30 | Cox | 3 |
| HST 354 E | French Revolution \& Napoleon | Capin 15 | M W F 10-10:50 | Belatsky | 3 |
| HST 361 E | History of the Far East I | Capin 15 | M W F 9-9:50 | Shao | 3 |
| PS 312 E | Intergovernmental Relations (Prereq: PS 102) | BDF 12 | T 6:30-9:15 | Tuhy | 3 |
| PS 324 A | Communist Systems (Prereq: PS 105 or consent of inst | $\underset{\text { :tor) }}{\text { SLC } 204}$ | M W F 11-11:50 | Bauzon | 3 |
| PS 331 A | Constitutional Law (Prereq: PS 102 or consent of inst | $\underset{\text { Stor) }}{\text { SLC } 204}$ | T Th 1-2:15 | Behuniak-Long | 3 |

MATHEMATICS/COMPUTER SCIENCE
MTH 311G A Functions of a Real Variable SLC 403 MWF 11-11:50 Berard 3 MTH 351GA Probability and $\quad$ SLC 405 TTh 2:30-3:45 Merrill Mathematical Statistics I
MTH 361G A $\quad$ Introduction to Applied $\quad$ SLC 405 TTh 9-10:45 Sours 3
CS 321G A Simulation and Data Analysis SLC 409 M W F 2-2:50 Merrill 3

Special Feature
Wilkes College Masters degree in Health Administration is accredited and formally approved by the Division of Academic Program Approval, Department of Education of the Commonwealth of Pennsylvania. Wilkes College is a member of the Council of Graduate Scho grams in Health Administration (AUPHA).
The Wilkes College Master of Business Administration has been extended to the Allentown area. Courses are offered at Allentown College.

The Division of Graduate Studies and Continuing Education is offering a variety of non-credit courses, workshops and seminars in professional development, cultural enrichment, and personal improvement. (There is a special brochure for the ContinuNational Registry for Continuing Education and the Council on the Continuing Education Unit.


## Wilkes College Fall Semester 1987 <br> - GENERAL INFORMATION -

Calendar for
Fall Semester

Weekend College
(at Keystone Junior College)

Admissions

Bookstore

Change Of
Schedule

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Registration for Evening College and Part-Time Day-School
Wednesday, Aug. 26
Thursday, Aug. 27 Wednesday, Sept. \(2 . .\). Friday, Oct. 16. Wednesday, Oct. 21 .......... . . . Classes resume at 8:00 a.m Tues., Nov. 24. Monday, Nov. 30 Thur., Dec. 17 thru Wed., Dec. 23
Classes resume at 8:00 \(\mathrm{a} . \mathrm{m}\). lasses resume at 8:00 a.m
.Final Examinations
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## Sept. 11 to Dec. 13 (including Final Examinations)

 Final Registration . .............................. . . September 1(Weekender Office, La Plume, Pa.) 4:30-6:30 p.m.

Wilkes College is accredited by The Department of Public Instruction of the State of Pennsylvania and the Middle States Association of Colleges and Secondary Schools. The Chemistry curriculum has been certified by the American Chemical Society. The Electrical Engineering and Materials Engineering programs are accredited by the ABET, the sole authorized accrediting agency for engineering programs.

Application for admission to Wilkes College as an evening college; part-time daychool or weekend college student should be made to the Office of Evening, Summer and Weekend College, 184 South River Street, Wikes-Barre, Pennsylvania 18766. Application for admission to Wilkes College as a full-time undergraduate student should be made to the Dean of Admissions.

Books, stationery and supplies may be purchased at the College Bookstore, located on the lower level of Pickering Hall. They must be paid for at the time of purchase. The Bookstore is open from 8:30 a.m. to 4:30 p.m. Monday through Friday.

The College reserves the right to cancel or reschedule any course due to insuffiient enrollment or any other reason. When possible, any change in the course schedule will be posted during registration. Students who have registered for courses that are subsequently cancelled or rescheduled will be notified as promptly as possible.

Day-Care is available for young children of Wilkes students from 7:00 a.m. to 5:30 p.m. at Child Development Council Centers near the campus. These services are partially subsidized by the College. For further information, contact Ms. Anne Graham, 824-4651, extension 367.
" "Certificate of Achievement" is available to undergraduate students in the field of Business Administration who earn 42 hours of credit in Evening Colege and Summer School programs with at least 24 hours in Business Administration and 18 hours in general education. Specific course requirements are available on request.

## All charges must be paid at the time registration forms are processed

 Undergraduate:Undergraduate students who register for fewer than 12 credits pay $\$ 150$ per credit. Fees: $\$ 3.00$ per credit hour general college fee.
Undergraduate students who register for 12 through 18 credits pay a flat tuition fee of $\$ 3,215$ per semester. (Students who take more than 18 credits pay $\$ 150$ for each credit above 18.)

Part-time as well as full-time students have a variety of aid programs available to them, but students must make formal application to estabish their eligibility. Therefore, ALL undergraduate students are urged to apply for Financial Aid. Forms for this purpose are available in the Financial Aid Office. Inquiries about financial aid should be made to the Financial Aid Office. Information about Veterans' Benefits is available through the Veterans' Affairs Office.

The Eugene Shedden Farley Library is open to all Wilkes students. Students may borrow books from the Library by presenting their College identification cards. Hours are posted at the beginning of each academic session.

Evening college; part-time day-school and weekend college students may withdraw, without prejudice, from any course at any time during the first 6 weeks of the semester, providing that they give written notice to the instructor and to the Director of Evening, Summer and Weekend College within this 6week period. (Charges for courses from which a student withdraws will be calculated as of the date recorded on the official withdrawal form.)

Students who have paid their tuition in full and who withdraw from courses or from the College will receive a refund of tuition, upon written request to the Comptroller's Office, according to the following schedule:

## Time of withdrawa

ition Refund 80\%

Financial Aid For Undergraduates

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Bachelor of Arts:
Art
Art Management
Biology
Biology
Chemistry
Communication Studies
Computer Information
Systems
Computer Science
Earth \& Environmental
Sciences
English
Bachelor of Science:
Accounting
Biology
Business Administration
Chemistry
Computer Science
Earth \& Environmental Sciences

Foreign Languages
History
ndividualized Studies
International Relations
Mathematics
Philosophy
Physics
Political Science
Psychology
Sociology
Theater Arts

Engineering
(a) Electrical Engineering
(b) Engineering Management
(c) Environmental Engineering
(d) Materials Engineering

Individualized Studies

## Mathematics

Medical Technology
Medical \& Health Physics
Nursing
Physics

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Students who have paid their tuition in full and who withdraw from courses or from the College will receive a refund of tuition, upon written request to the Comptroller's Office, according to the following schedule:

## Time of withdrawa

Tuition Refund
First two weeks
80\%
60\%
Fifth week
40\%
After fifth week
no refund
Weekend College students who have paid their tuition in full and who withdraw from Weekend College classes will receive a refund of one-half of their tuition through the second weekend of classes, upon written request to the Comptroller's Office within this period. No refunds will be made after the second weekend of classes.
Fees are non-refundable. No student who is suspended or expelled shall be entitled to any refund.

## For further information, write or call:

## Barbara E. King, Director

Evening, Summer and Weekend College
Wilkes College
184 South River Street
Wilkes-Barre, Pennsylvania 18766
Phone: (717) 824-4651, Ext. 380
Toll-free: from Scranton, Pennsylvania 342-5617
from elsewhere in Pennsylvania (800) 572-4444
from outside of Pennsylvania [Middle-Atlantic and
New England Regions] (800) 537-4444

Financial Aid For Undergraduates

| Undergraduate Registration <br> (New students or students in need of counseling Chase Hall, 2nd Fl.) <br> (Returning students - Sturdevant Hall, 1st Fl.) <br> Wednesday, August 26. $\qquad$ .8:30 a.m.-8:00 p.m. Thursday, August 27 $\qquad$ .8:30 a.m.-8:00 p.m. |
| :---: |
|  |  |
|  |  |


| Course | Description | Room | Day \& Hour | Credits |
| :---: | :---: | :---: | :---: | :---: |
| ACCOUNTING |  |  |  |  |
| ACC 121 E | Introduction to Financial Accounting Fee: $\$ 20.00$ | DDD 201 | M 6:30-9:30 | 3 |
| ACC 122 E | Introduction to Managerial Accounting (Prereq: ACC 121) <br> Fee: $\$ 20.00$ | DDD 201 | Th 6:30-9:30 | 3 |
| ACC 211 E | Intermediate Accounting \| (Prereq: ACC 122) | DDD 201 | W 6:30-9:30 | 3 |
| ACC 221 E | Taxes I <br> (Prereq: ACC 212 or approval of instructor) | DDD 202 | W 6:30-9:30 | 3 |
| AEROSPACE STUDIES |  |  |  |  |
| AS 000 E | Leadership Laboratory | Armory 0 | Th 7:00-9:00 | 0 |
| AS 201 E | Development of Air Power I | SLC 160 | Th 5:00-5:50 | 1 |
| AS 301 E | Concepts of Management \& Leadership I (Prereq: POC membership) | BDF 13 | Th 3:30-5:50 | 3 |
| ANTHROPOLOGY |  |  |  |  |
| ANT 270 E | Cultural Anthropology (May be substituted for ANT 101) | SLC 204 | W 6:30-9:30 | 3 |
| ART |  |  |  |  |
| ART 101 E | Experiencing Art | SLC 206 | M 6:30-9:30 | 3 |
| ART 255 E | Graphic Arts Production | SLC 115 | MW 6:30-8:15 | 3 |
| BUSINESS ADMINISTRATION |  |  |  |  |
| BA 209 E | Business Correspondence \& Reports | BDF 12 | M 6:30-9:30 | 3 |
| BA 225 E | Managerial Finance | DDD 101 | Th 6:30-9:30 | 3 |
| BA 231 E | Business Law - Introduction, Contracts, and Sales | SLC 270 | M 6:30-9:30 | 3 |
| BA 241 E | Life Insurance | SLC 270 | T 6:30-9:30 | 3 |
| BA 251 E | Principles of Management | BDF 13 | Th 6:30-9:30 | 3 |
| BA 261 E | Principles of Retailing | SLC 209 | W 6:30-9:30 | 3 |
| BA 397 E | Seminar: Entrepreneurship | Capin 15 | W 6:30-9:30 | 3 |
| COMPUTER SCIENCE |  |  |  |  |
| CS 115 E | Survey of Computers and Data Processing | SLC 411 | MW 6:30-8:00 | 3 |
| CS 320 E | Logic and Switching Circuits (Prereq: EE 211) | SLC 403 | T Th 8:00-9:30 | 3 |
| CS 326 E | Operating System Principles (Prereq: CS 227/EE 343) | SLC 403 | MW 6:30-8:00 | 3 |
| EARTH \& ENVIRONMENTAL SCIENCES |  |  |  |  |
| EES 120 E | Survey of Meteorology | SLC 380 | Th 6:00-7:50 | 3 |
| EES 120*E | Laboratory <br> Fee: $\$ 35.00$ | SLC 435 | Th 8:00-10:00 | 0 |


| Course | Description | Room | Day \& Hour | Credits |
| :---: | :---: | :---: | :---: | :---: |
| ENGLISH |  |  |  |  |
| ENG 101 E | Composition I | SLC 209 | M 6:30-9:30 | 3 |
| ENG 151 E1 | Western World Literature I (Prereq: ENG 102 or equivalent in composition) | SLC 1 | T 6:30-9:30 | 3 |
| ENG 151 E2 | Western World Literature I (Prereq: ENG 102 or equivalent in composition) | SLC 1 | Th 6:30-9:30 | 3 |
| HISTORY |  |  |  |  |
| HST 101 E | World Civilization I | SLC 207 | T 6:30-9:30 | 3 |
| HST 102 E | World Civilization II | SLC 380 | T 6:30-9:30 | 3 |
| HST 334 E | The United States, 1900-1945 | Capin 15 | T 6:30-9:30 | 3 |
| HST 335 E | The United States since 1945 | Capin 15 | M 6:30-9:30 | 3 |
| MATHEMATICS |  |  |  |  |
| MTH 101 E | Fundamentals of Mathematics I | SLC 409 | MW 8:00-9:30 | 3 |
| MTH 111 E | Calculus I <br> (Prereq: MTH 100 or at least 3 years of high school math including Geometry, Algebra II, and topics in Trigonometry.) | SLC 409 | MW 6:00-8:00 | 4 |
| MTH 211 E | Introduction to Linear Algebra and Differential Equations (Prereq: MTH 112) | SLC 405 | MW 6:00-8:00 | 4 |
| MUSIC |  |  |  |  |
| MUS 101 E | Introduction to Music | DDD 218 | T 6:30-9:30 | 3 |
| NURSING |  |  |  |  |
| NSG 200 E | Principles of Normal Nutrition (Prerea: CHM 130) (Coreq: NSG 201) | SLC 380 | W 6:30-9:30 | 3 |
| NSG 203 E | Nursing Care of the Adult Client \| (Prerea: NSG 202) <br> Fee: $\$ 75.00$ | SLC 347 | MW 6:30-8:30 | 8 |
| NSG 271 E | Health Care Terminology (Held every other week) | SLC 380 | M 6:30-8:30 | 1 |
| NSG 272 E | Clinical Application of Pharmacology (Prereq: J. and Sr. Nursing students and R.N.'s only) | SLC 318 | T 6:30-9:30 | 3 |
| NSG 299 E | Nursing Forum I (Prereq: R.N.'s only) | SLC 334 | T Th 6:30-9:30 | 6 |
| NSG 303 E | Issues and Trends in Nursing (Prereq: NSG 204) <br> (Coreq: NSG 301 or NSG 302) | SLC 311 | Th 6:30-9:30 | 3 |
| NSG 305 E | Introduction to Research (Prereq: NSG 204, MTH 150) | SLC 316 | T 6:30-9:30 | 3 |
| NSG 307 E1 | Physical Assessment (Prereq: R.N.'s only) | SLC 311 | M 6:30-9:30 | 3 |
| NSG 307 E2 | Physical Assessment (Prereq: Senior Nursing majors or R.N.'s only) | SLC 316 | Th 6:30-9:30 | 3 |

PHYSICAL EDUCATION

## WEEKEND COLLEGE CLASSES

## Fall, 1987

on the campus of Keystone Junior College
La Plume, Pennsylvania
September 11 - December 13, 1987

## Calendar - Fall, 1987

| September | $11,12,13$ |
| :--- | :--- |
| October | $2,3,4$ |
| *Octover | $16,17,18$ |
| November | $6,7,8$ |
| *November | $20,21,22$ |
| December | $11,12,13$ |
|  | -2-week interal between classes |


| A Schedule | B Schedule | C Schedule |
| :--- | :--- | :--- |
| Fri. 6:30-8:30 | Sat. $8: 00-10: 00$ | Sat. 6:000-8:00 |
| Sat. 10:10-12:10 | Sat. 1:00-3:00 | Sun. 8000-10:00 |
| Sat. 3:10-5:10 | Sun. 10:10-12:10 | Sun. 1:00-3:00 |

Unless otherwise indicated, all courses in the Weekend College meet according to the above schedule:
(TIMES IN LIGHT FACE REPRESENT A.M. and TIMES IN BOLD FACE P.M.)

| Course | Description | Room | Schedule | Credits |
| :---: | :---: | :---: | :---: | :---: |
| ACCOUNTING |  |  |  |  |
| ACC 244 W | Advanced Accounting (Prerea: ACC 212) | TBA | C | 3 |
| BUSINESS ADMINISTRATION |  |  |  |  |
| BA 398 WA | Marketing Research (For Management or Marketing Concentration) | TBA | B | 3 |
| BA 398 WB | New Product Management (For Management or Marketing Concentration) | TBA | C | 3 |

## BIOLOGY

BIO 103 W Biological Science I TBA A 3



Evening, Summer and Weekend College
Wilkes College
Wilkes-Barre, Pa. 18766


## CORRESPONDENCE DIRECTORY

Write to these persons for additional information on particular matters:

Bernard Vinovrski
Dean of Admissions
Correspondence concerning admission to Wilkes and visits to the campus for interviews. Campus tours and conferences with admissions counselors should be arranged in advance, when possible.

## Doris Barker

Registrar
Correspondence concerning registration matters and academic records of currently enrolled or former students.
Jane Lampe-Groh
Dean of Student Affairs
Correspondence concerning student activities and readmission of former students.
John G. Reese
Athletic Director
Correspondence concerning intercollegiate athletics

Office Hours: 8:30 to 4:30
Monday through Friday
(717) 824-4651 (local)
(800) 572-4444 (in Pennsylvania)
(800) 537-4444 (adjacent states)

## Statement of Nondiscrimination

Wilkes College is committed to the policy that all persons shall have equal access to admission, programs, and employment without regard to race, religion, sex, national origin, handicap, age, or status as a disabled or Vietnam-era veteran.

Statement of Disclaimer
The statements set forth in this Bulletin are for informational purposes only, and the College reserves the right to change any provisions or requirements, including tuition and fees, at any time within the student's term of residence.

Mark Allen
Director of Residence Life
Correspondence concerning residence matters for enrolled students.

Frances French
Assistant Director of Financial Management

Correspondence concerning student accounts and other fiscal arrangements for new and currently enrolled students.

Rachael L. Lohman
Director of Financial Aid
Correspondence concerning financial aid.

## Barbara King

Director of Evening, Summer, and Weekend College

Correspondence concerning part-time studies and International Students.

Mailing address:
WILKES COLLEGE
Wilkes-Barre, Pennsylvania 18766

## 1987-88

## Bulletin

Undergraduate Studies

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


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## Admissions

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"Our goal is to produce good people - young men and women who learn to think to the point where thinking is a habit; who have been exposed to and who have developed methods and approaches to the intelligent and who in tnowledge and last but not least, who accept the


## Wilkes College

Wilkes College had its beginning in 1933 when Bucknell University established its Junior College in Wilkes-Barre. On June 26, 1947, Bucknell University Junior College came to an end and Wilkes College received its charter as a four-year, coeducational, liberal arts college. In 1959, the College was authorized to begin offering graduate programs. As the reputation and programs of this increasingly comprehensive institution continued to expand, the College reorganized itself in 1986 into a College of Arts and Sciences, a School of Business and Economics, and a School of Engineering and Physical Sciences. This new structure serves the approximately 1,700 full-time day students, 600 part-time students, and over 900 graduate students very well, and the College's enviable student to faculty ratio has been enhanced by this reorganization.

## Organization

The Chief Executive Officer of Wilkes College is the President. Directly beneath the President in the administrative structure are the Vice Presidents for Academic Affairs, College Advancement, and Business Affairs and Auxiliary Enterprises. The academic departments are administered under three divisions, each with a Dean as its administrative head: the College of Arts and Sciences, the School of Business and Economics, and the School of Engineering and Physical Sciences.

## The College of Arts and Sciences

The Dean of the College of Arts and Sciences represents fifteen departments. The academic departments within the College assume responsibility for the curricula of the traditional liberal arts: the humanities, the social sciences, and mathematics and the natural sciences. All students at Wilkes College will complete some course-work in these disciplines, since study in the arts and sciences provides 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 College of Arts and Sciences. In addition, its departments provide programs for students majoring in the various arts and sciences, as they prepare for careers in the sciences, business and industry, government, the arts, and education.

The College of Arts and Sciences includes the following departments

| Aerospace Studies | Music |
| :--- | :--- |
| Art | Nursing |
| Biology | Philosophy |
| Chemistry | Physical Education and Health |
| Education | Psychology |
| History and Political Science | Sociology and Anthropology |
| Language and Literature | Speech, Communications, and |
| Mathematics and | Theater Arts |
| Computer Science |  |

## The School of Business and Economics

The Dean of the School of Business and Economics represents three departments. The School offers a variety of programs leading to a B.S. in Accounting or Business Administration, and a B.A. in Economics. Minors in all three areas also are available. The various courses of study prepare students for management positions in business, industry, the nonprofit sector, and government, as well as professional licensings and graduate education. Interdisciplinary ventures, such as the Computer Information Systems and Engineering Management programs, provide opportunities for students to create individual educational experiences. The School also offers the Master of Business Administration Degree and Master of Health Administration Degree.
The School of Business and Economics includes the following departments:

## Accounting <br> Business Administration <br> Economics

## The School of Engineering and Physical Sciences

The Dean of the School of Engineering and Physical Sciences represents three departments. The School offers a wide variety of programs and degrees, which provide strong engineering and scientific experience with advanced techniques heavily integrated into the curriculum. This philosophy encompasses the graduate, the undergraduate, and the two-year programs offered by the Departments of Earth and Environmental Sciences, Engi. neering, and Physics. All of the programs offered by the School are available to the part-time and evening student.

The strength of the programs offered by the School is their balance of the theoretical and practical, of liberal learning and professional preparation. Students have the opportunity to apply knowledge to real problems by working in state-of-the-art laboratories instructed by highly qualified faculty. Beyond balancing theory and practice, the faculty seeks to increase the student's capacity to serve others with intelligence, imagination, and integrity. This effort is directed toward preparing students for positions in industry, government, and the non-profit sector as well as graduate schools.

In the scientific outreach effort stressed by the School, there has been a strong affiliation with the community to aid in research and development, education, and technology training and transfer. Funding of joint collegeindustry projects has underscored the high level of scientific and technological expertise, and has included relationships not only with local firms but with world leaders in industry.
The School has entered into transfer articulation agreements with local and national two-year colleges as well as four-year colleges and universities.
The College of Engineering and Physical Sciences includes the following Departments:

$$
\begin{aligned}
& \text { Earth and Environmental Sciences } \\
& \text { Engineering } \\
& \text { Physics }
\end{aligned}
$$

## Mission of the College

Wilkes College is an independent, non-denominational college 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 College has developed strong professional programs in accounting, business, communications, computer science, engineering, music, the health sciences, and nursing. Wilkes prides itself on being an institution where students with varying preparation for college work can receive a quality education that will prepare them for the challenges of a rapidly changing world and make them fully competitive in major graduate and professional schools.
Wilkes brings together motivated students and 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 reaffirms its long-standing 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 insure 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 wellequipped 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 community students in an atmosphere that promotes their full social and personal development.

A vital part of the mission of Wilkes College 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 outstanding cultural events that the College 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 College has become a regional center for engineering, science, and technology. The College 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 College'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, engineering and applied sciences, and health administration are designed to prepare for professional opportunities.
Wilkes College will continue to offer an education that prepares its students to deal intelligently with the complexities of a rapidly changing society as it approaches the twenty-first century.

Accreditation
Wilkes College is accredited by the Department of Education of the Commonwealth of Pennsylvania and 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 Eugene Shedden Farley Library, completed in 1968 and named after the first president of the College, is a major resource for the region and a superior small-college library. It contains more than 180,000 volumes of books and bound journals, 1,250 current journal and newspaper subscriptions, about 500,000 units in microforms, an extensive collection of research materials in English literature, American cultural history and the history of science, and one of the finest retrospective collections of serials in the region. All materials are shelved in open stacks, and the air-conditioned building is open seven days a week with comfortable study areas for 500 students. Special facilities for students include the Media Center, the microroom for both micro-materials and reading/printing equipment, direct access to the collections of various regional academic, public and medical libraries through the Northeastern Pennsylvania Bibliographic Center as well as instant access to a nationwide network of thousands of research, academic, public and special libraries through the Interlibrary Loan System of the Online Computer Library Center.
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 the College 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 College'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 College 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 College 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 the College's 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 College's Computer Support Center.

The Computer Support Center supports the academic and administrative functions of the College 24 hours a day 7 days a week, including the automation of the College's library operation. Academic support provides assistance to 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 college hours; additional hours are posted at the beginning of each term. These units offer a large and growing variety of software including wordprocessing, graphics, CAD, spreadsheet, database management, and simulation. The Hewlett Packard 3000/68 with 5-MBytes of memory and 1.6-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.
The Gymnasium 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 current gymnasium seats 2,000 and planning is underway to expand the facilities in size and function. In addition to playing fields for baseball, softball, field hockey, soccer, and football, the College has a weight room and asphalt tennis courts. Wilkes actively promotes usage of all of its facilities by all constituencies of the Col lege.

The College'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, fulltime 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.



## Student Life

Wilkes College is a community of learning in which creative scholarship, personal growth, and social relationships are interwoven. Students, faculty and staff work together to promote individual development through a vari ety of activities, programs, organizations and cultural opportunities which support student life and complement the academic program. All campus organizations are open to all students, and all of them work in close cooperation with faculty advisors and deans.

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

## Student Activities

An active Student Government and numerous campus clubs and specialinterest organizations provide a structure of activities for student life outside of the classroom. An Inter-Residence Council and a Commuter Council or ganize many activities for resident and commuter students, and a Student Programming Board oversees a full schedule of social events at the College.
Students publish the Beacon, a weekly newspaper; the Manuscript, an annual journal of art, poetry, and fiction; and the Amnicola, the College yearbook. The College 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 ensem bles, and an active intercollegiate forensics and debate organizaion.

## Sigma Xi

Sigma Xi, the Scientific Research Society, has established a local affiliate on the Wilkes College 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, professional, and industrial re searchers 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 College is a member of the Middle Atlantic Collegiate Athletic Conference
(MAC), the Eastern Collegiate Athletic Conference (ECAC), and the Na tional Collegiate Athletic Association (NCAA).

## College Activities

In addition to the curricular and cocurricular activities of particular or ganizations, a number of all-campus and campus-community events ar 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 College joins area cultural groups each year for the annual two-weekend Cherry Blossom Fes tival and for the Fine Arts Fiesta, a four-day festival of music, drama, and the arts founded by the College and presented each spring. A carefully se lected Concert and Lecture series is presented throughout the regular college year at Dorothy Dickson Darte Center for the Performing Arts and is open to the College community and public without charge as are regular concerts and recitals presented by the Music Department.

## Student Services

Wilkes College 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 deans, or the department chairmen regarding academic matters. Recognizing that students some times need additional guidance in resolving personal, social or academic problems, the College has also institutionalized a variety of programs to as sist students, individually and in groups, during their term at the College and afterwards.

## New-Student Orientation Program

The transition from the directed work of the high school to the independent and more intensive work of the college is smoothed by introducing new students to the College and its services before classes formally begin. Several days during the summer and at the beginning 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 the advising system at the College.

## 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 College and its services. Each freshman is as-
signed to a freshman advisor during the orientation period and will meet with this advisor regularly throughout the freshman year to arrange sched ules, discuss academic and career plans, and deal with problems or ques tions as they arise. At the conclusion of the freshman year, full-time student are re-assigned to advisors within the department or program in which they choose to major or concentrate. These faculty advisors add the special ex pertise of their disciplines to the advising process and acquaint students with supplemental advising and counseling services available at the College.

## 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 spokesman 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 Organization. These services are available to all international students, non-immigrants and immigrants alike.

## Part-time Student Advisor

The Director of the Evening, Summer, and Weekend College serves as academic advisor and counselor to all part-time undergraduate students at the College. Part-time students are eligible for all services provided by the College but may need to make appointments with certain offices beyond normal college hours; thus, they are advised to meet regularly with the Director who will assist in these matters as well as refer part-time students to the appropriate offices for particular needs.

## 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 College has named advisors in special areas of interest. The Dean of Health Sciences functions as a special advisor to all students interested in professional or graduate school opportunities in medical or health-related fields. The Pre-Law Advisor works with students from any discipline who wish to go on to law school. The International Studies Advisor counsels students in matters relating to studying abroad and career and professional opportunities in this field. The Director 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 virtually anywhere on campus, but the Office of the Dean of Student Affairs serves as a readily accessible and convenient source of information for these and other services provided for students.

## 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 College community, and provides general information about campus and community resources. The Dean of Student Affairs is generally familiar with all College services and specifically coordinates the activities of the residence-life staff and the Director of Student Activities as well as the College Health Service, the College Counseling Service, the College Testing Service, and the Office of Career Services.

## College Health Service

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

## College Counseling Service

The Counseling Service is available to individual students during normal college 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 College Counseling also works closely with all student groups and College personnel to provide timely workshops and group sessions on areas of interest or concern such as assertiveness training, time management, or health-related topics.

## College Testing Service

The College maintains a Testing Center to assist the deans and faculty in their counseling of students. The College Testing Service is also available, at no charge, to all current Wilkes students as well as College 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 College and potential employers in business, industry, government, and educational institutions. Students are encouraged to familiarize themselves with the services provided by this Office upon their arrival on campus and to use them regularly in all phases of their career development.
Typical services include career counseling workshops on resume preparation, interviewing skills and job search strategies. In addition, the Career Services Office operates a credentials service for all registered candidates, maintains contact with professional and educational organizations through



Admissions

Admission Requirements
Admission Procedures
Advanced Placement

## Admission

## Required High School Preparation

A student's secondary school preparation should include a pre-college curriculum with four years of English, three years of mathematics, and a minimum of one year of history and one year of a laboratory science. 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) so as 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 program.

## 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 $\$ 20$ 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 College 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 are required to forward a $\$ 150$ tuition and dormitory deposit by May 1 in order to guarantee their entry into the College. Commuting students are required to forward a $\$ 75$ tuition deposit by May 1.
Upon their acceptance for admission to the College, music applicants will be required to audition for the music faculty.
The College 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 College 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 College, 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 College Office of Admissions), official transcripts of all secondary and/or postsecondary work completed to date, and a copy of the secondary and/or postsecondary 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 College 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 college transcript from each 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 chairman of the Department of Nursing.
All transfer students must complete a minimum of one-half of their major field credits at Wilkes College.
Transfer students from two-year institutions must complete a minimum of 60 credits at baccalaureate degree-granting institutions. The last 30 of these credits, at minimum, must be earned at Wilkes College.
Grades earned in courses accepted for transfer are not included in the computation of the cumulative grade point average earned at Wilkes College.
College 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 College

Students who have been enrolled full-time at the College and have terminated their studies, but wish to return as full-time students must meet with one of the deans in the Student Affairs Office as the first step in the readmission process. Former full-time students who wish to return as part-time students will meet with the Director of Evening, Summer, and Weekend College to discuss their readmission.

## Admission of Part-time Students

Those who wish to enroll as part-time students should contact the Director of the Evening, Summer, and Weekend College to discuss their plans and to obtain an Application for Admission. Students who have completed collegelevel work at another institution must submit an official transcript of their 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 Director of the Evening, Summer, and Weekend College.

## 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 College as the first step in this process. Students having completed 30 credits or more and having maintained a grade point average of 2.00 will automatically 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 rendered.

## Full-time to Part-time

Students who have been enrolled full-time and wish to become part-time students should meet with one of the deans in the Student Affairs Office as the first step in this process. Normally, these students will retain their major advisor for a period of one year after they make this transition. After one year, the Director of the Evening, Summer, and Weekend College will become their academic advisor.

## Advanced Placement Credit

Wilkes College 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 College 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 College. Although the program is designed primarily for adults, exceptionally well qualified high school seniors may find it advantageousto 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 |
| 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 | $3 \& 3$ |
| Calculus w/Elem. Func. | Mathematics 111 | 4 |
| Statistics | Mathematics 150 | 4 |
| 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 |
| *Scores must be at the 50th percentile or above. | $3 \& 3$ |  |
| ation |  |  |

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

## Credit for Military Experience

Students who have completed the special educational programs offered by branches of the American armed services may be granted academic credit for this course-work. Such students should submit an official transcript of their work as part of the admissions process. Transcripts will be evaluated according to the guidelines provided by the American Council on Education, and credits granted will be applied to the degree program as appropriate. For more information on this program, contact the Office of Admissions.

## Challenge Examinations

After admission to Wilkes College, students may elect to take examinations demonstrating their competence in a particular course. Advanced placement and/or credit can be earned by successfully passing a Challenge Examination administered by the appropriate department. Interested students should contact the appropriate department chairman to discuss the particulars of the examination.
A fee of $\$ 20$ per credit will be assessed for each Challenge Examination. The fee is payable in advance of the examination and a receipt from the Finance Office must be presented before the Challenge Examination will be administered.

## RN - Validation of Prior Learning

Registered nurse students and students who are eligible to sit for NCLEXRN 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.

## Credit for Life Experience

After admission to Wilkes College and when all other means of securing credit for demonstrated competencies have been exhausted, a student may petition for credit for life experience. Petitions must be submitted through the Director of the Evening, Summer, and Weekend College, though the final decisions on such petitions are made by the Academic Standards Committee on the recommendation of the Subcommittee for Life Experience. Credit awarded on the basis of life experience may not exceed 30 hours, and these credits may not be applied to the Core Requirements or to courses required by the major. Information on the procedures for applying for life experience credit may be obtained from the Office of Evening, Summer, and Weekend College.


Expenses and Financial Assistance

Tuition and Fees
Payment of Charges
Financial Aid
Application Procedures
Types of Financial Assistance

## Student Expenses

The following chart summarizes student expenses for the 1987-88 academic year which offically begins with the 1987 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 Finance Office.

## Student Expenses for 1987-88

| Full-time Undergraduate: | Assessment | Each Semester |  |
| :---: | :---: | :---: | :---: |
| *Tuition (12-18 Credits) | Per Semester | \$3,215 |  |
| Room and Board | Per Semester | \$1,650 |  |
| Room Damage Deposit | One Time | \$ 50 |  |
| General College Fee | Per Semester | \$ 60 |  |
| Activity Fee | Per Semester |  |  |
| *Credits above 18 will be assessed at the rate of \$150 per credit h |  |  |  |
| Part-time Undergraduate: |  |  |  |
| Tuition ( $1-111 / 2$ credits) | Per Credit | \$ | 150 |
| General College Fee | Per Credit | \$ | 3 |
| Summer Sessions - Undergraduate: |  |  |  |
| Tuition | Per Credit | \$ | 150 |
| General College Fee | Per Credit | \$ |  |
| Summer Board | Per Week | \$ | 45 |
| Summer Room | Per Week | \$ | 45 |
| Room Damage Deposit | One Time | \$ | 50 |
| Other Fees and Charges: |  |  |  |
| Acceptance Deposit: |  |  |  |
| Resident Student | One Time | \$ | 150 |
| Commuter Student | One Time | \$ | 75 |
| Application Fee | One Time | \$ | 20 |
| Applied Music Fee: |  |  |  |
| Full-time Student | Per Lesson Series | \$ | 150 |
| Part-time Student | Per Lesson Series | \$ |  |
| Audit Fee: |  |  |  |
| Full-time Students | No Tuition Charge |  |  |
| Part-time Students | Per Credit | \$ | 75 |
| Bad Check Charge | Each | \$ | 10 |
| Challenge Exam | Per Credit | \$ | 20 |
| Graduation Fee | One Time | \$ | 65 |
| Installment Payment Plan (Application Fee) | One Time | \$ | 50 |
| Late Registration Fee | Per Semester | \$ | 10 |

Other Fees and Charges: Mandatory Accident Fee (Commuter/Full-time)
Medical Technology Fee (During Clinical Training) Music Major Fee
New Student Orientation Fee

Liability Insurance
Replacement of lost ID cards
ROTC Uniform Deposit
ROTC Uniform Deposit
Sickness Insurance (opt
Full-time Student Part-time Student

Assessment
Per Year

| Per Semester | $\$ 1,125$ | $\$ 2,250$ |  |
| :--- | :---: | :---: | :---: |
| Per Semester | $\$$ | 20 | $\$$ |
| One Time | $\$$ | 50 | - |

Each Semester Total for Year
\$ 70

One Time
Per Year
Each One Time

Per Year Per Semester
$-\quad \$ 46$

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. A minimum payment of one-half of the net bill for each semester must be paid before the start of the semester. The net bill is the balance due after financial aid has been deducted from the current semester charges. The remainder of the Fall Semester bill must be paid by November 1; the remainder of the Spring Semester bill must be paid by March 1 .
Any indebtedness to the College 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 College 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 Finance Office. Questions concerning charges or payments should be directed to the Coordinator of Student Accounts in the Finance Office.

## Monthly Payments

Wilkes College has developed an interest-free, eleven-month installment payment plan (IPP) to help ease the burden of financing an education. Arrangements may be made to finance any amount between $\$ 2,000$ and the full cost of tuition and fees. Payments begin in July and end in May of each aca-
demic year. IPP applications for the upcoming academic year are available in April of each year.
Two additional extended payment plans are available through the Knight Insurance Company. The SCHOOL CHEX plan allows parents to borrow from a prearranged line of credit and use special checks to pay the College bills when they become due. The EXTENDED REPAYMENT PLAN is an insured loan program which allows for the payment of educational expenses over a period of 10 years. Parents may use these programs to cover all or part of the costs of education at Wilkes College and can select the annual amount and the number of years of education to finance. For further information, including application procedures, write or call the Knight Tuition Payment Plans, 53 Beacon Street, Boston, Massachusetts 02108. Telephone (617) 742-3911.

VISA/MasterCard
Wilkes College accepts Visa and MasterCard for tuition and fee payments.

Tuition Discounts
Five tuition discounts are available to Wilkes undergraduates who meet eligibility requirements. For application procedures, contact the Financial Aid Office.

Alumni Discount: Wilkes encourages graduates of the College to continue their education. Therefore, alumni qualify for a $25 \%$ discount on tuition for undergraduate courses and a $\$ 10$ per credit discount on 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 College alumni. This discount applies only to those 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 College is a member of the Tuition Exchange Plan which provides limited opportunity for faculty children from one college to enjoy tuition
remission benefits at another institution. Students who are dependents of College faculty, administration or staff should consult the Tuition Exchange Liaison Officer at their institution 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 College 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 College, which is available at the Financial Aid Office.)
Students suspended from the College for disciplinary reasons will forfeit all refunds.
Refunds are available as indicated on the following chart:
Refund Schedule*

| Refund Schedule* |  |  |
| :---: | :---: | :---: |
| Circumstance | Time of Withdrawal | Refund |
| Academic Year: |  |  |
| Tuition: <br> 80\% |  |  |
| Total Withdrawal | First Two Weeks Third \& Fourth Weeks | $\begin{aligned} & 80 \% \\ & 60 \% \end{aligned}$ |
|  | 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 | Prorated from end of |
|  | 15-week semester | official withdrawal week |
| 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 |  |
|  | After second weekend | No refund |

*Fees are non-refundable.

## Financial Aid

Wilkes College maintains an extensive program of financial assistance for its students in the form of scholarships, grants, loans, and part-time employment. To assist qualified students, the College receives substantial gifts each year from friends and alumni. These funds, combined with those furnished by the federal and state governments, are offered to students in financial aid packages.
Students with questions about financial aid or students seeking applications for financial aid should contact the Financial Aid Office. More detailed information regarding the financial aid programs and requirements is included in the Consumer's Guide to Financial Aid, Costs, and Charges at Wilkes College, which is also available at the Financial Aid Office.

## Application Procedures

1. Submit the Wilkes College Application for Financial Aid to the Wilkes College Financial Aid Office.
2. Complete the PHEAA/Federal Student Aid Application and forwardit to PHEAA, Harrisburg, PA. The College 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 College Scholarship Service. The College code is 2977.
4. Students who desire to participate in the Guaranteed Student Loan Program 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 39, Wilkes Co lege is approved to participate in PHEAA's Scholars in Education Program and in the Federal Congressional Teachers' Scholarship. Also, several academic units at the College have scholarships available to qualified students.

These include the Athletic Department (wrestling only); Biology Department, School of Business and Economics, School of Engineering and Physical Sciences, English Department, History and Political Science Department, Music Department, Nursing Department, Sociology Department, and the Speech, Communications and Theater Arts 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 College 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. In addition to on-campus employment, the Office of Career Services operates a JOB LOCATION DEVELOPMENT PROGRAM (JLD) to help students obtain employment opportunities offcampus. The operation of this program is funded jointly by the federal government and the College. Students are paid by the employer for whom they work. For more information, interested students should contact the Office of Career Services.
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 Veteran Work-Study Program, and other sources of Veterans Assistance. The College also has a Veterans Affairs Office to assist students in obtaining these benefits.


Summary of Financial Assistance Programs*

| Program | Annual Award | Application(s) Required | Fling Deadline |
| :---: | :---: | :---: | :---: |
|  |  | scholarships |  |
| Truste Scholasthips | S5.804 | PHEAA /Federal Studen Aiid Application and Wilkes College Financial Aid A Pplicaion | Upperclass sududend deadline - May 1 , 1987 |
| Dean's scholarsships | ¢ |  | Contact Wilkes College Admissions Office |
| Achievement scholarships | $\underset{\substack{\text { S1,475 }}}{\text { Sli }}$ |  |  |
| Room \& Board Scholarships | ${ }_{\text {S }}^{5}$ S2,462 |  |  |
| Wilkes Named Scholarships Transfer Student Scholarship | com |  |  |
| ROTC Scholarships | S6, 150 | Contact the Wilkes College ROTC Office | Contact Rotc office |
|  |  | GRaNTS |  |
| Pell Grant | \$1,316 | PHEAA/Federal Student Aid Application or | May 1, 1988 |
| PHEAA Grant | \$1,375 | PHEAA/Federal Student Aid Application | May 1, 1987 |
| SEOG Grant | \$ 812 | PHEAA/Federal Student Aid Application and | Upperclass student deadline - May 1, 1987 |
| Wilkes Need-Based Grant Wilkes Act 101 Grant | $\$ 1,117$ <br> $\$ 1,796$ <br> 2,1 | Wilkes College F Financial Aid Application | Incoming student deadline - Rolling basis as |
| Office of Vocational Rehabilitation Grant | \$2,895 | Contact the Office of Vocational Rehabilitation | Contact office of Vocational Rehabilitation |
|  |  | Loans |  |
| Carl Perkins Loan (NDSL) | \$1,233 | PHEAA/Federal Student Aid Application and | Upperclass student deadine - May 1, 1987 |
| Nursing Student Loan | \$1,374 | Wilkes College Financial Aid Application |  |
| ${ }_{\text {Guif }}^{\text {Guison Evans Loan }}$ | \$\$1,200 |  |  |
| Guaranted Sudent Loan | \$2,285 | Guaranted Student Loan Application and | Six to eight weeks prior to need for loan proceeds |
| PHEAA-HELP Guaranteed Student Loan | \$1,457 | PHEAA/Federal Student Aid Application |  |
| PLUS/Supplemental Loan |  | PLUS//Supplemental Loan Application | Six to eight weeks prior to need for loan proceeds |
| PHEAA-HELP Altermate Loan | ${ }_{53,681}$ | PHEAA-HELP Loan Application | Six to eight weeks prior to need for loan proceeds |
|  |  | employment |  |
| Federal College Work-Sudy Program | \$1,247 | PHEAA/Federal Student Aid Application, <br> Wilkes College Financial Aid Application, and | Prior to beginning work on campus |
| Institutional Employment | \$1,467 | Wilkes College Application for Student Employment | Prior to beginning work on campus |




| Summary of Fiancial Assistance Program |  |  |  |
| :---: | :---: | :---: | :---: |
| ram | Antuaft | Applacatonts Recutirad | Ninor De |
|  |  | scmomrsurs |  |
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|  | cos. |  |  |
|  |  |  |  |
|  | ${ }_{\substack{\text { coil }}}^{\text {neil }}$ | Contact the Wilies College Rotc office | Conatect ROTC Office |
| Pell Gramt |  | grants |  |
|  | \$1,316 | PHEAAF Federa S Sudern Aid Appiciation or | May 1, 1988 |
|  |  |  | May 1.1987 , |
|  |  | PHEAAF Federas STudern Aid A ppiliaion and |  |
|  | ¢ | Conact the Office of Voational Rehabilitaion |  |
| Carl Perkins Loan (NDSL) <br> Gulf Oil Loan <br> Rulison Evans Loan <br> Guaranteed Student <br> aranteed Student Loan <br> PLUS/Supplemental Loan PHEAA-HELP Alternate Loan |  |  |  |
|  | ¢ | PHEAAFFedera Sudem Aid Appliation and |  |
|  |  |  | dra aviable |
|  | cis | Curanced Suduen Luan Appiciation and | Six to eight weeks priorto need for loan proceed |
|  |  |  |  |
| Federal College WorkS.Sudy Progam |  |  |  |
|  | S1,247 | PHEAA/Federal Student Aid Application | Prior to begiming work on can |
| Instiutiona Employment | \$1.467 | WWikes colege Appiriation or iosudent Employment | Prior to begining work on campus |
| Institutiona Employment | s1,467 | Wilies College Application for Sudent Employment | Prior fobegiming workon campus |



Academic Information

The Calendar
Part-time, Graduate and Continuing Education
The Curriculum
The Degrees
Academic Policies and Procedures
Academic Requirements
Graduation Requirements

Academic Information
Calendar
The academic year at Wilkes College consists of two semesters. The Fall Semester normally begins in early September and always concludes with final examinations before the holidays in December. The Spring Semester begins in early to mid-January and closes with a final examination period in May. Commencement exercises are scheduled later in May at the conclusion of the academic year.

The College also provides a broad range of courses in three different summer sessions. The first summer session begins early in 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.

Part-time, Graduate and Continuing Education
Part-time Studies
The College welcomes part-time undergraduate students into all of its reg. ular sessions. It has also established the Evening College and the Weekend College to maximize scheduling possibilities for students who cannot attend day classes. Majors in several disciplines are offered in the Evening College and Weekend College, and students may utilize both options, in addition to day-school, 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 part-time studies should be directed to the Director of the Evening, Summer, and Weekend College.

Evening College
The Evening College is designed to meet the needs of those students who cannot attend day-school but wish to pursue a degree. Courses normally meet one or two nights per week during the academic year and three nights per week during the eight-week evening summer session. A majority of the degree programs at the College are available in the Evening College. Students interested in the Evening College format should arrange to meet with the Director of the Evening, Summer, and Weekend College to plan a course of study suitable to their needs.

Weekend College
Wilkes' Weekend College provides the upper-division courses that will permit graduates from Keystone Junior College and other two-year institutions to complete their bachelor's degrees by taking courses strictly on weekends. Transfer students from other accredited institutions are also welcome. Those students beginning as freshmen in the Weekend College will apply for admission through Keystone Junior College.
The courses meet every third weekend on the campus of Keystone Junior College, La Plume, Pennsylvania ( 10 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. Students should be able to complete their baccalaureate degrees in slightly more than two calendar years. Weekend College students are eligible for federal financial aid (PELL grants) and veteran's benefits, where applicable. Inquiries about the Weekend College should be directed to the Director of the Evening, Summer, and Weekend College.

Graduate Studies
The Division of Graduate Studies offers a wide range of quality programs leading to master's degrees. Degree programs are available in the fields of Business Administration, Biology, Chemistry, Earth and Environmental Sciences, Education, Engineering, Health Service Administration, Mathematics, and Physics. The graduate programs feature quality faculty academicians and professionally established teacher-practitioners, outstanding facilities, and flexible scheduling for both full-time and part-time graduate students. Inquiries about graduate studies should be addressed to the Office of Graduate Studies. A separate Graduate Bulletin, which describes the graduate programs in detail, is available on request.

Continuing Education
In addition to courses for credit, Wilkes College provides a dynamic nondegree Continuing Education program which responds to the changing needs and interests of the community. This program provides training and development service to business, industry, government, associations, professionals, and individuals. Through the use of public seminars, in-house presentations and conferences, the Continuing Education Division offers programs in supervisory training, management development, executive development, research and continuing professional education. Many of the programs sponsored by the division provide Continuing Education Units (CEU's) for students who want or need formal documentation of their work. Inquiries about the offerings of the Continuing Education Division should be addressed to the Office of Continuing Education.

## Degree Programs

Wilkes College 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.

## Goals of the Educational Program at Wilkes College

Wilkes College is committed to the liberal education of men and women who value learning for its own sake throughout their lives and participate responsibly as enlightened members of society. The institution's curriculum is designed to stimulate the intellectual, emotional, social, and physical development of each student. Our principal goals are to familiarize students with the content of the various realms of human inquiry, facilitate the integration of their knowledge into a unified whole, provide opportunities for them to acquire a depth of understanding in at least one field of study, and develop their unique capabilities. We believe that every liberally educated person:

- thinks critically, analytically, and creatively;
- communicates effectively;
- cultivates aesthetic sensibilities;
- explores ethical, intellectual, and social values;
- makes ethical judgments based upon a consciously developed moral value system;
- understands and appreciates cultural diversity from historical and contemporary perspectives;
- appreciates the dynamics of an individual functioning within a complex society;
- understands scientific principles and their relationship to technology and culture;
- applies quantitative reasoning in the presentation and interpretation of data;
- pursues life-long recreational activities, acknowledging the importance of physical well-being;
- correlates these goals of liberal learning with career and professional perspectives.


## The Curriculum

The Wilkes Curriculum has three components. The first is called the Core Curriculum because it provides the common foundation in the liberal arts and sciences of all of the bachelor's degrees awarded by the College. Through the Core, all students are introduced to the common life of learning, reflection, and discussion in which they are expected to share during their college years. Normally, students complete their Core Requirements during their first two years.
A second component of the Wilkes Curriculum is the major. This component provides for in-depth study of a field of specialization. The requirements for each major are found in this Bulletin under the departmental listing. This part of the Curriculum is usually undertaken during the junior and senior years.
The third component of the Wilkes Curriculum enables the student to pursue personal interests, to explore new areas of learning, or to pursue a minor or a second major. This component is composed of elective courses, which are usually taken during the student's junior or senior years.

## The Core Curriculum: The First Curricular Component

The General Core Requirements consist of a broad spectrum of courses in the liberal arts and sciences designed to enhance intellectual, emotional, social, and physical development. These courses, which are central to a liberal education, are required of all Wilkes College students in the B.A., B.F.A. and B.S. programs except the B.S. programs in Engineering and Medical Technology. Students in the Bachelor of Music Program take 18 credits in the Humanities, including English 101-102; 12 credits in the Social Sciences, including Psychology 101; and 6 credits in Mathematics/Science.
The General 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 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 College requirements, including the Core Requirements, are satisfied.

## Core Requirements

Skills
English 101-102 (or competency)
$0-6$ credits
Students who demonstrate competency in writing may be exempted from English 101 and 102
Mathematics (or competency)
tudents who scored less than 450 in mathematics on the SAT must tak mathematics unless they scored $50 \%$ or higher on the Wilkes Mathematics Placement Test
Computer Literacy
All Wilkes graduates are required to have some experience in the use of computer as a problem-solving tool. This requirement may be fulfilled by
a. passing any credit course in computer science, or
b. passing Mth 101-102, or
c. petitioning the Department of Mathematics and Computer Science for a waiver on the basis of previous work with the computer. Th student may be required to write a program in a language of his/her choice before the waiver is granted.
Physical Education
0 credits
This involves a four-semester requirement in physical education. Students will participate in different learning experiences each semester

## Humanities

18 credits
Any three of the following:
two courses in literature
English 151-152 are the core requirements. Students may substitute other courses, but must respect prerequisites or secure departmental permission.
two courses in a foreign language
Students with two years of high school study in a foreign language should begin at 203 or higher. Students may elect Foreign Language 101-102, but must complete a sequence in a single language through at least the 204 level if using language to fulfill the humanities require ment.
wo courses in history
Normally, the 101-102 sequence will fulfill the core requirements in history. However, students may substitute advanced courses with th written approval of the instructor, or the chairman of the History and Political Science Department.
two courses in philosophy

## Arts

Any three credits in Art, Theater Arts, or Music

Social Sciences
Any four courses in Economics, Political Science, Psychology, Sociology or Anthropology with no more than two in any one discipline.

## Mathematics/Science

12-16 credits
Any two of the following (at least 12 credits)
a. two courses in Mathematics or Computer Science except that

1. Mth 100 must be followed by Mth 105, Mth 111, or Mth 150
2. only one of CS 115 (Survey of Computers and Data Processing), CS 123 (Fortran), and CS 124 (Cobol) may be counted in this requirement
b. two courses in biology
c. two courses in chemistry
d. two courses in earth and environmental sciences
e. two courses in physics

Courses required in one's major may also be used to fulfill core requirements.

Total
$45-65$ credits

## Selection of a Major: The Second Curricular Component

Each student must complete a major in a discipline or area of concentration in order to be graduated from Wilkes College. Specific requirements for each major are described in detail in the departmental listing in this Bulletin.

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

| Art | English | Philosophy |
| :--- | :--- | :--- |
| Biology | French | Physics |
| Chemistry | German | Political Science |
| Communication Arts | History | Psychology |
| Computer Science | Individualized Studies | Sociology |
| Earth | Ind Environmental | International Studies |
| Sciences | Mathematics | Spanish |
| Speech Pathology |  |  |

## Bachelor of Science Degree - Major

Majors in the Bachelor of Science degree program may be selected from the following subject areas:
Accounting
Biology
Business Administration
Chemistry
Computer Information
$\quad$ Systems
Computer Science
Earth and Environmental
Sciences

Electrical Engineering
Engineering Management
Environmental Engineering
ndividualized Studies
Materials Engineering
Mathematics
Medical Technology
Nursing
Physics

Bachelor of Fine Arts Degree
Students in the Bachelor of Fine Arts program may pursue more concentrated study in specific studio disciplines in the visual arts.
Bachelor of Music Degree
Students in the Bachelor of Music program choose a major in either performance or music education. Students may elect to complete both majors with additional course work and one additional semester for the completion of student teaching.
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, for example. Some students use this component of the curriculum to add to their credentials.

Selection of a Minor
One of the common reasons students select elective courses is to complete a minor in a field different from the major. 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.

Teacher Education
Students who wish to prepare for a teaching career select an appropriate 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 are urged to seek counseling in the Education Department early in their first semester at the College.
Cooperative Education
Cooperative Education, another possible use of elective credits, is a program that formally integrates a student's studies with productive 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 Director of Cooperative Education shortly after their arrival on campus.

Study Abroad Program
The Study Abroad Program, a part of the International Studies major and an attractive 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 College. Overseas study may be for a period of a year, a semester, or a summer and is generally undertaken by students who have achieved junior standing at Wilkes. 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 Coordinator in the Department of Sociology and Anthropology.

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 chairmen 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 College beyond those required for the first degree.
A candidate for a second degree must complete all requirements for the degree at Wilkes College. 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 chairman of the proposed major department.

## Academic Policies and Procedures

Wilkes College has adopted a number of policies and procedures governing its academic programs. Many of these standards are generally described in this Bulletin. Students are advised to consult with their advisors regularly to obtain more specific information on particular policies or procedures or to clarify matters that are unclear.

## 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 College Calendar; late registrants will be assessed a late fee. Additional information on registration procedures and the exact dates of the orientation sessions can be obtained from the Office of Admissions.

## Attendance

Attendance at all classes is expected. Repeated absence is deemed a sufficient cause for failure.

After five consecutive absences from a class, a student may be readmitted to the class only by action of the appropriate counseling dean and the department chairman concerned.

## Student Load

Students may register for as many as 18 credits in a semester. No students shall be allowed to carry an overload (i.e. credits in excess of 18 ) without the written approval of their advisor and the appropriate counseling dean. An overload will be permitted only for students with a minimum grade point average of 3.00 or for those with special need.

## Wilkes/King's Cross-Registration

Wilkes College and King's College offer their students an opportunity to cross-register for courses at either institution. The intention is to broaden the range of courses available to the student; only courses not offered at the college where the student is enrolled are open for cross-registration. Courses carry full credit and grade value and are considered as part of the student's regular course load; no additional tuition charge is made. Students register through the Registrar at the College where they are enrolled as degree candidates. Interested students should confer with their Registrar for further details

## Auditing Courses

Auditing courses is a practice designed primarily for the purpose of allowing a student to expand his/her educational opportunities beyond the limitations imposed by courses taken in fulfillment of normal graduation requirement.
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 permis sion 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 transfer from one department to another shall obtain the approval of the advisor and the department chairman. 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 and the Student Affairs Office.

## Transfer of Credits into Wilkes College

Wilkes students desiring to take courses at another college during any academic term must secure prior approval from the Director of the Evening, Summer, and Weekend College. The student must earn a grade of 2.00 or higher for the work to be credited toward graduation. All students must complete the last 30 credits in residence at the College
Grades earned for transfer credits are not included in the calculation of grade point averages.

## Withdrawals

A student may withdraw from any course through the sixth week of instruction, notifying his instructor, his advisor, and the appropriate counseling dean of his intentions prior to withdrawal. This process must be completed and all necessary paperwork placed in the hands of the Registrar prior othe completion of the sixth week of instruction. After the sixth week, students may withdraw only with the written approval of the course instructor, the faculty advisor, and the appropriate counseling dean. Students not fulfilling these requirements and not satisfactorily completing the course will receive a grade of " 0 ".

No student who has been advised to withdraw from the College's day school for academic reasons will be permitted to register in the Evening or Weekend College without approval of the Academic Standards Committee

## 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 their evaluative records which have been established by Wilkes College. Such records might typically include those maintained by the Office of Ca reer Services, the Health Services Office, the Registrar's, and the Deans Offices. These records will be open to inspection in the presence of the appropriate college official. Students wishing to review their files must make an appointment at least one day in advance.

## Academic Requirements

## Grades

The primary purpose of any marking system is to inform the student of his achievement. Marks also aid in evaluating students for the purpose of rec ommendation. Grade reports are sent to students at the end of each term. Mid-term reports are sent if the work is unsatisfactory.
Eight numerical grades are given for academic work:

| Grade | Interpretation |
| :---: | :---: |
|  | Academic achievement of outstanding quality. |
|  | Academic achievement above high quality. |
|  | 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. If the incomplete is not removed within this time, or an extension of time granted by the instructor who gave the grade or by some other authorized person, and the Registrar's Office so notified, the grade will be changed to a zero on the student's record.

## Course Credits and Grade Point Average

Each course at the College 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. The number of credits carried by each course is a major factor in the calculation of a student's grade point average.
Below is an example illustrating the method used to compute point averages.

| Course | Credit Hrs. Carried | Grade | Points | $\begin{aligned} & \text { Credit Hrs. } \\ & \text { Passed } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: |
| 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 carried | . 15 |  |  |  |
| Total credit hours passed |  |  |  | 12 |

Total credit hours passed ........
Total points earned .............
33
Average $33 \div 15=2.20$
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.

## Dean's List

The faculty gives recognition for high quality work. Students on the Dean's List, published at the end of each term, must obtain a grade point average of 3.25 or higher for all courses taken. Students taking fewer than twelve credit hours will not be eligible for the Dean's List.

## Academic Probation and Ineligibility

Freshmen, defined as students who have attempted fewer than thirty-six credits, must maintain a 1.70 in both their major and cumulative grade point
averages. All other students must maintain a minimum 2.00 in both their major and cumulative grade point averages. Any student who falls below the minimum average required will automatically be placed on academic probation. At the end of the first semester, a student whose grade point average is less than 0.5 may be declared academically ineligible.
The Academic Standards Committee meets at the end of each semester and the second summer session to review the record of any student who does not meet these averages, which have been established by the faculty. The Committee may place a student on academic probation; may declare a student ineligible to continue course work at the College; or may declare a student ineligible to continue unless the student's major is changed.
Students placed on academic probation may be restricted in the number of credits they take the following semester. The Academic Standards Commit tee may impose additional restrictions and requirements in individual cases when it determines such restrictions and requirements are in the best interest of the student and the College. Such restrictions may include the student's participation in extracurricular activities.

Students who have been declared academically ineligible are not allowed to enroll in course work at the College for a period of one year. To be considered for readmission such students need to apply for readmission through the Dean of Student Affairs Office and be approved for readmission on a probationary status by the Academic Standards Committee.

Any decision of the Academic Standards Committee may be appealed by the student. Appeals must be presented to the Committee either in person or by letter, and should include good and sufficient reasons for appealing.


## 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 students must satisfy in order to be eligible for graduation:

1. They must successfully complete a minimum of 120 credit hours
2. They must satisfy all requirements in their 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. They must 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. All students must complete the last $\mathbf{3 0}$ credits in residence at the College.
4. They must obtain a minimum cumulative average of 2.00 for all courses
5. They must obtain a minimum cumulative average of 2.00 for all subjects within their major.
6. They must obtain a minimum cumulative average of 2.00 for all subjects within the chosen minor(s).
7. They must satisfy all requirements pertaining to the physical education program.
8. They must demonstrate competence in written and spoken English
9. They must demonstrate competence in Mathematics and computer literacy.

No student shall be graduated until all financial obligations to the College have been satisfied.

## 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 College with the cumulative average equal to the honors received to be considered for honors. The entire academic record, including grades earned at Wilkes College and any other institution attended, is used to compute the final cumulative average for honors.
Requirements for Honors are:

| Summa Cum Laude | 3.80 |
| :--- | :--- |
| Magna Cum Laude | 3.50 |
| Cum Laude | 3.25 |



## ACCOUNTING

Associate Professor Broadt, Assistant Professors Chisarick, Cordora, Croop.
Total minimum number of credits required for a B.S. degree - 126 Total minimum number of credits required for a minor - 24 .

The School of Business and Economics 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 successfully compete for placement in graduate schools, professional schools, and licensing as certified public accountants or certified management accountants. Those choosing a career in administration or management also receive adequate managerial training for future leadership roles in the private, the industrial, or the governmental sector
The accounting curriculum parallels the business administration major with a combination of three or four educational levels. A comprehensive study of the arts, sciences, mathematics, communications, and humanities provides a basic core of education. This core, which is a common experi ence to all majors, is the basis for a well-rounded, well-educated person. The second level of educational experience provides a broad 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 of education is also available. Students with the classroom background described may participate in a practical experience by applying for an accounting internship. Most students are placed with public accounting firms where it is possible to readily experience a broad range of business problems in the shortest possible time-span. However, for students with a more specialized interest, accounting internships are also available in banking, industry, and with the government. This program has been available at Wilkes College for the past thirty years and all qualifying applicants have been placed in positions of their choice, including the large international accounting firms that have offices throughout the world.
The accounting curriculum is a demanding and rigorous educational experience. The technical background of study required 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 any state's legal requirements as a candidate for the certified public accounting examination.
Students from many 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. Upon completion of six credithours of prerequisites (Acc 121-122), an additional eighteen credits are required. The minor program would be composed of Acc 211-212, and twelve additional credits in accounting.
Accounting alumni completing the program described above can now be found in accounting firms ranging in size from those of individual practitioners to international accounting firms with clients throughout the world. Many of our graduates who began their careers with such firms have since moved into leadership positions with the federal government or private industry. Selecting the accounting major in the School of Business and Economics at Wilkes College will provide the individual with the combined educational skills to be a future success as a leader in the accounting profession, industry, or in government.
This educational experience, with its liberal roots, will also provide a responsible individual with an appreciation of the social and cultural environment reflective of a true professional.

Recommended Course Sequence for a Degree in Accounting Major in Accounting

| First Semester |  | Second Semester |  |
| :---: | :---: | :---: | :---: |
| Eng 101 Composition I | 3 | Eng 102 Composition II | 3 |
| Core Requirements* | 12 | CS 115 Survey of Computers | 3 |
| PE 100 Activity | 0 | Core Requirements | 9 |
|  |  | PE 100 Activity | 0 |
|  | 15 |  | 15 |
| Third Semester |  | Fourth Semester |  |
| Acc 121 Accounting I | 3 | Acc 122 Accounting II | 3 |
| Ec 101 Economics I | 3 | Ec 102 Economics II | 3 |
| SCT 101 Public Speaking | 3 | Core Requirements | 9 |
| Core Requirements | 9 | PE 100 Activity | 0 |
| PE 100 Activity | 0 |  |  |
|  | 18 |  | 15 |

[^0]
## Sixth Semester

Acc 212 Intermediate Acc II Acc 224 Advanced Taxes** Ec 232 Statistics II
BA 226 Investments
A 232 Business Law II Free Elective

Eighth Semester

| Acc 231 Auditing | 3 |
| :--- | ---: |
| Acc 233 Cost Accounting | 3 |
| Acc 251 Senior Seminar** | 3 |
| $\quad$ (prerequisite for Acc 252) |  |
| Ec 201 Money and Banking | 3 |
| BA 251 Management | $\frac{3}{15}$ | Acc 234 Accounting Systems* Acc 244 Advanced Accounting Acc 252 Internship* Free Elective

## 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
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 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 ested 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 which are not covered in other courses

## AEROSPACE STUDIES (Air Force ROTC)

Lieutenant Colonel Billings, Professor, Chairman; Assistant Professors Captain Lynn, Major Newton, Captain Zimmerman.

The Air Force ROTC program at Wilkes College 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 of ficer Course (POC) during the last two years. The GMC is open to all in coming 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 SCHOLAR SHIP. 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 rat ing. Four-year cadets must complete a four-week field training program POC 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-semes-ter-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 COLLEGE OF FERS 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. 371 (in state) or 1-800-537-4444, ext. 371 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 College and the U.S. Air Force. All new GMC cadets are required to pay an initial deposit of $\$ 40.00$. All new POC cadets are required to pay an initial deposit of $\$ 105.00$. 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 small weekly salary.

## Leadership Laboratory (mandatory

AFROTC cadets must participate in Leadership Laboratory two hours every other 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

AS 101 U.S. Military Forces in the Contemporary World I AS 000 Leadership Laboratory

Second Semeste
AS 102 U.S. Military Forces in the Contemporary World II AS 000 Leadership Laboratory

Third Semester
AS 201 The Development of Air Power I
AS 000 Leadership Laboratory

Fourth Semester
AS 202 The Development of Air Power II AS 000 Leadership Laboratory

AS 000 Leadership Laboratory is mandatory for all cadets who enroll in Air Force ROTC. Lab meets for two hours, twice per month, usually at the Kingston Armory.
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. 371, within stateo 1-800-537-4444, ext. 371, 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 en rolled in the POC receive $\$ 100$ per month and are under military obligation.

## Fifth Semester

AS 301 Concepts of Management A 000 Leadership Laboratory

## Seventh Semester

AS 311 National Security Forces
in American Society 1
AS 000 Leadership Laboratory

## Sixth Semester

AS 302 Concepts of Leadership AS 000 Leadership Laboratory

Eighth Semester
AS 312 National Security Forces 3 in American Society II AS 000 Leadership Laboratory

AS 000 Leadership Laboratory is mandatory for all cadets who enroll in Air Force ROTC. Lab meets for two hours, twice per month, usually at the Kingston Armory.
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 sopho ore year. For further information, call (717) 829-0194 or 1-800-572-4444, ext. 371, within state or 1800-537-4444, ext. 371, from adjacent states.

## General Military Courses

The General Military Courses (GMC) constitute a two-year program for freshmen and sophmores and are designed to provide a general knowledge of the role, organization, missions, estelat Force scholarships incur no military obligations. Note: AS 101-102-201-202 may be substituted for PE 100 series.

AS 000. LEADERSHIP LABORATORY a supervised training laboratory. Examines Air Force customs and courtesies, drill and cereins offered. One section meets every other Thursday for two hours. 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 Tues day afternoons. All dual-enrolled students must elect both sections.

As 101. U.S. MILITARY FORCES IN
THE CONTEMPORARY WORLD I
Background, missions, and functions of U.S. military forces, with emphasis on U.S. Air Force organization, doctrine, and strategic forces.

AS 102. U.S. MILITARY FORCES IN
THE CONTEMPORARY WORLD II lorces and organizations.

AS 201. THE DEVELOPMENT OF AIR POWER I
Fall - One credi
Air power development in historical perspective through the end of World War II; evolutional missions, concepts, doctrine, and employment, with emphasis on changes in conflict and fire tors which have prompted technological developments.

AS 202. THE DEVELOPMENT OF AIR POWER II Spring - One cre 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.
Prerequisite: AS 201 or permission of instructor.
AS 251. FLIGHT PROGRAM GROUND TRAINING
Spring - One cred Prepares AFROTC cadets and others for FAA private pilot examination through study of general regulations, air traffic rules, accident reporting, air navigation, weather, safety, principt of flight, basic operations, flight computer. Limited spaces beyond AFROTC requirements 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 take 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 scienci schools; study of information systems; quantitative approach to decision-making; policy for mulation, 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 $\mathbf{3 0 1}$ for BA 251.

AS 302. CONCEPTS OF LEADERSHIP
Spring - Three credits Air Force leadership at the junior officer level, including its theoretical, professional, and lega 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 civilmilitary interaction; basic framework of defense policy and formulation of defense strategy. development of individual communicative 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 credils
The problems of developing defense strategy in a rapidly changing technological environmen; effective deterrent posture and management of conflict; dynamics and agencies of defense pol: icy making, analyzed through case studies.
Prerequisite: AS 311 or permission of instructor.

## ANTHROPOLOGY

Assistant Professor Tutwiler
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 153 and 214). 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 p

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 credit 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 archaeoogy.
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 diretion 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 credit
Presentations and discussions of selected themes and issues in anthropology
Prerequisite: Criteria will vary according to content of seminar.
ANT 398. TOPICS
Three credit
A study of topics of special interest not extensively treated in regularly offered courses.


## Recommended Course Sequences for Art Degrees

| First Semester |  |  |  | Second Semester |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \text { Fine Arts } \\ & \text { B.A. } \quad \text { B.F.A } \end{aligned}$ |  | $\begin{aligned} & \text { Com. } \\ & \text { Design } \end{aligned}$ |  | Fine Arts B.A. B.F.A |  | ${ }_{\text {coma }}^{\text {cosp }}$ |
| Art 103 Color \& Design I | 3 | 3 | 3 | Art 104 3-D Design | 3 | 3 |  |
| Art 105 Drawing \& Composition | 3 | 3 | 3 | Art 206 Color \& Design II | 3 | 3 |  |
| Eng 101 Composition I | 3 | 3 | 3 | Eng 102 Composition II | 3 | 3 |  |
| Core Requirements | 6 | 6 | 6 | Core Requirements | 6 | 6 |  |
| PE 100 Activity | 0 | 0 | 0 | PE 100 Activity | 0 | 0 |  |
|  | 15 | 15 | 15 |  | 15 | 15 |  |

Third Semester

| Third Semester |  |  |  |
| :--- | :---: | :---: | :---: |
|  | Fine Arts <br> B.A. | B.F.A | Com. <br> 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 | 6 | 6 | 9 |
| PE 100 Activity | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ |
|  | $\mathbf{1 5}$ | $\overline{15}$ | $\overline{\mathbf{1 8}}$ |

Fifth Semester

| Fifth Semester |  |  |  | Sixth Semester |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{gathered} \text { B.A } \\ \text { B. } \end{gathered}$ | B.F.A | $\begin{aligned} & \text { Com. } \\ & \text { Design } \end{aligned}$ |  | B. ${ }_{\text {F }}{ }^{\text {Fine }}$ | $\begin{aligned} & \text { Arts } \\ & \text { B.FA } \end{aligned}$ | ${ }_{\text {com }}^{\text {Dising }}$ |
| Art 217 Modern Art | 3 | 3 | 3 | Art 300-Level Elective | 3 | 3 | 3 |
| Art 233 Sculpture I | 3 | 3 | - | Major Elective | - | 3 | 3 |
| Art 243, 248 , or 270 | 3 | 3 | - | Core Requirements | 9 | 9 | 9 |
| Art 255 Graphic Prod. | - | - | 3 | Free Elective | 3 | - | - |
| SCTA 222 Video Prod. | $\square$ | - | 3 |  | 15 | $\overline{15}$ | 15 |
| Core Requirements | 6 | 6 | 6 |  |  |  |  |
|  | $\overline{15}$ | 15 | 15 |  |  |  |  |


| Seventh Semester |  |  |  | Eighth Semester |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Fine Arts <br> B.A. B.F.A |  | Com. Design |  | $\begin{aligned} & \text { Fine Arts } \\ & \text { B.A. B.FA } \end{aligned}$ |  | ${ }_{\text {Onem }}^{\text {cam }}$ |
| Major Electives | - | 9 | - | Design Topic | - | - | 3 |
| Free Electives | $\frac{15}{15}$ | $\frac{6}{15}$ | $\frac{9}{15}$ | Art 490 Advanced Problems | - | 9 | 6 |
|  | 15 | 15 | 15 | Art 397 Sem: Contemp. Issues | 2 | 2 | $?$ |
|  |  |  |  | Free Electives | 15 | 6 | 3 |
|  |  |  |  |  | 17 | 17 | 14 |

## Recommended Course Sequences for Art Education

| First Semester |  |  |
| :--- | ---: | ---: |
|  | B.A. | B.F.A. |
| Art 103 Color \& Design I | 3 | 3 |
| Art 105 Drawing \& | 3 | 3 |
| Composition |  |  |
| Eng 101 Composition 1 | 3 | 3 |
| Psy 101 General Psychology | 3 | 3 |
| Core Requirements | 3 | 3 |
| PE 100 Activity | $\mathbf{0}$ | $\mathbf{0}$ |
|  | $\mathbf{1 5}$ | $\underline{15}$ |

## Third Semester

3 B.A. B.F.A.
Art 220 Life Drawing Ar 220 Life Drawin Art 221 Painting Ed 101 Practicum d 201 Intro. to Educ Phl 101 Intro to Phil PE 100 Activity
B.A. B.f.A.
B.A. 217 Modern Art
$\begin{array}{lll}\text { Ant 217 Modern Art } & 3 & 3 \\ \text { Art 233 Sculpture I } & 3 & 3 \\ \text { Art } 243 \text { or } 248 \text { or } 270 & 3 & 3\end{array}$
Art 243 or 248 or 270
Core Requirement

| 3 | 3 |
| :--- | :--- |
| 3 | 6 |

6
$\overline{15} \overline{18}$

Seventh Semester
Ed 204 Art Curricula B. B. B.F.A. $\begin{array}{lll}\text { Art } 300 \text {-Level Elective } & 3 & 3 \\ 3 & -\end{array}$ Major Electives Majo Electives Core Requirements

Ninth Semeste
At 490 Advanced Pion B.A. B.F.A.
Art 490 Advanced Problems - 9 Major Electives

Second Semester
Art 104 3-D Design
A. B.F.A. Art 206 Color \& Design II Eng 102 Composition II Psychology Electiv Core Requirements PE 100 Activity

## Fourth Semester

Art 116 History of Artll B.A. B...A. Art 225 Printmaking I 3 Art 225 Printmaking Ed 202 Educ. Psych PE 100 Activity

$$
\overline{15} \quad \overline{15}
$$

Sixth Semester

|  | B.A. | B.F.A. |
| :--- | ---: | ---: |
| Art 243 or 248 or 270 | 3 | 3 |
| Art 397 Sem: Contemp. | 2 | 2 |
| $\quad$ Issues |  |  |
| Art 300-Level Elective | - | 3 |
| Ed 102 Practicum | 1 | 1 |
| Ed 203 Art Methods | 3 | 3 |
| Core Requirements | $\underline{9}$ | $\mathbf{6}$ |
|  | $\mathbf{1 8}$ | $\mathbf{1 8}$ |

## Eighth Semester

Ed 371 Indiv. in Classroom Ed 380 Prof. Semester

Recommended Course Sequence for a Degree in Art Management

| First Semester |  |
| :--- | ---: |
| Art 103 Color \& Design I | 3 |
| Art 105 Drawing \& Composition | 3 |
| Eng 101 Composition I Economics I | 3 |
| Ec 101 Principles of Eco | 3 |
| Core Requirements | 3 |
| PE 100 Activity | $\underline{0}$ |
|  | $\mathbf{1 5}$ |


| Third Semester |  |
| :--- | ---: |
| Art 115 History of Art । | 3 |
| Art 220 Life Drawing | 3 |
| BA 216 Advertising | 3 |
| or Acc 101 Elementary Accounting I |  |
| Core Requirements | 6 |
| PE 100 Activity | $\underline{0}$ |
|  | 15 |


| Fourth Semester |  |
| :--- | :---: |
| Art 116 History of Art II |  |
| Art 254 Graphic Design |  |
| BA 222 Marketing |  |
| or Acc 102 Elementary Accounting II |  |
| Core Requirements |  |
| PE 100 Activity |  |


| Fifth Semester |  |
| :--- | ---: |
| Art 270 Photography I | 3 |
| Art History 200-level | 3 |
| BA Elective | 3 |
| or BA 251 Principles of Mgmt. <br> Core Requirements |  |
|  | $\underline{6}$ |

Sixth Semester
3 Art Elective BA Elective or BA 254 Organizational Design Core Requirements

Seventh Semester OOP 301 Internship BA Elective
Core Requirements
Free Electives

The Coilege of Arts and Sciences

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 $\qquad$ 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 formal$i \mathrm{sm}$. 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. $\qquad$
Prerequisite:
Art 105 o
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 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
An exploration of both traditional and contemporary methods of the fabric enharee credits 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 260. ART IN THE ELEMENTARY CLASSROOM
Two credits
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 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.
(same as Ed. 324)

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 chairman is required.

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

## ART 198/298/398. TOPICS

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 adviser. The exhibition may be presented either in the fall or spring term.

## BIOLOGY

Professor Turoczi, Chairman; Associate Professors Hayes, Houseknecht; Assistant Professors Bottjer, Klemow, Long; Professors Emeriti Ogren, Reif; Adjunct Professor Debra Zehner.

Total minimum number of credits required for a B.A. degree - 121 . Total minimum number of credits required for a B.S. degree - 121 . 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 up-per-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 307, 312, 315, 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, 223-224 plus two 300-level, three-credit biology electives. These upper-level electives (exclusive of Independent Research, Bio 395396) will be selected after consultation with the department chairman.

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 Degree in Biology

| First Semester |  |  | Second Semester |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | B.A. | B.S. |  | B.A. | B.S. |
| Bio 121 Principles of Modern Biology I | 4 | 4 | Bio 122 Principles of Modern Biology II | 4 | 4 |
| Chm 115 Elements \& Compounds | 4 | 4 | Chm 116 The Chemical Reaction | 4 | 4 |
| Eng 101 Composition I | 3 | 3 | Eng 102 Composition II | 3 | 3 |
| Mth 105 Calculus for | 4 | 4 | Mth 106 Calculus for | 4 | 4 |
| Life, Managerial, and |  |  | Life, Managerial, and |  |  |
| Social Sciences I or |  |  | Social Sciences II or |  |  |
| Mth 111 Calculus I |  |  | Mth 112 Calculus II |  |  |
| PE 100 Activity | 0 | 0 | PE 100 Activity | 0 | 0 |
|  | 15 | 15 |  | 15 | 15 |


| Third Semester |  |  | Fourth Semester |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | B.A. | B.S. |  | B.A. | B.S. |
| Bio 223 Comparative Anatomy | 4 | 4 | Bio 224 Cellular and Molecular Biology | 4 | 4 |
| Chm 231 Organic Chemistry I | 4 | 4 | Chm 232 Organic Chemistry II | 4 | 4 |
| Core Requirements | 6 | 6 | Core Requirements | 6 | 6 |
| PE 100 Activity | 0 | 0 | PE 100 Activity | 0 | 0 |
|  | 14 | 14 |  | 14 | 14 |


| Fifth Semester |  |  | Sixth Semester |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | B.A. | B.S. |  | B.A. | B.S. |
| Bio 397 Seminar* | 1 | 1 | Bio 397 Seminar* | 1 | 1 |
| Bio Elective/Research | 3 | 3 | Bio Elective/Research | 3 | 3 |
| Phy 105 Introductory Physics I | 4 | 4 | Phy 106 Introductory Physics II | 4 | 4 |
| Core Requirements | 6 | 6 | Core Requirements | 6 | 6 |
| Free Elective** | 3 | - | Free Elective** | 3 | - |
| Mth 150 Elementary Statistics | - | 3 | Computer Science Elective | - | 3 |
|  | 16-17 | 16-17 |  | 16-17 | 16-17 |
| Seventh Semester |  |  | Eighth Semester |  |  |
|  | B.A. | B.S. |  | B.A. | B.S. |
| Bio Elective/Research | 3 | 6 | Bio Elective/Research | 3 | 6 |
| Core Requirements | 6 | 6 | Core Requirements | 3 | 3 |
| Free Electives** | 6 | 3 | Free Electives** | 9 | 6 |
|  | 15 | 15 |  | 15 | 15 |

'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

BIO 103. BIOLOGICAL SCIENCE I
Three credits Biological Science I covers the basic structure and functions of plant and animal cells, taxon omy, plant diversity, and the interrelationships between plants and man. It is open only to nonbiology majors. Lecture, two hours a week; laboratory, two hours a week. Laboratory fee: $\$ 25$.

BIO 104. BIOLOGICAL SCIENCE II Three credits Biological Science II covers diversity of organisms other than plants, form and function in animals, development, genetics, evolution, and behavior. The relationships between animals and man are emphasized. This course is open only to non-biology majors. Lecture, two hours a week; laboratory, two hours a week. Laboratory fee: \$25.

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 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. Lab ratory 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: $\$ 35$. 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 223. 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. Prerequisite: Bio 121-122.

BIO 224. 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, 223.

BIO 303. BACTERIOLOGY Three 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
laboratory, three hours a week. Laboratory fee: $\$ 35$.
Prerequisite: Bio 121-122, 223-224, 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: $\$ 35$,
Prerequisite: Bio 121-122, 223-224, or permission of instructor,
BIO 305. INVERTEBRATE BIOLOGY
Three 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: $\$ 35$.
Prerequisite: Bio 121-122, 223-224, or permission of instructor.

BIO 307. ANALYTICAL CYTOLOGY
Three credits tivities by means of microscopic tivities by means of microscopic techniques, and instrumentation. Lecture, two hours a week; laboratory, three hours a week. Laboratory fee: $\$ 35$.
Prerequisite: Bio 121-122
(122, 223-224, or permission of instructor.
BIO 308. GENETICS
Three credits Genctis 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. Prerequisite: Bio 121-122, 223-224, 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: $\$ 15$.
Prerequisite: Bio 121-122, 223-224, or permission of instructor.
BIO 310. ANIMAL BEHAVIOR Three 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: $\$ 35$.
Prerequisite: Bio 121-122, 223-224, or permission of instructor.
BIO 312. COMPARATIVE PHYSIOLOGY
Three 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: $\$ 35$.
Prerequisite: Bio 121-122, 223-224, 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: $\$ 35$.
Prerequisite: Bio 121-122, 223-224, 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, carweek week.
Prerequisite: Bio 121-122, 223-224, Chm 231-232, or permission of instructor.
BIO 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.
Prerequisite: Bio 121-122, 223-224, or permission of instructor.
BЮ 318. DEVELOPMENTAL BIOLOGY
Three credits A course dealing with principles of organismic development, gametogenesis, fertilization, cleavage, embryogenesis, differentiation, morphogenesis, regeneration. Laboratory work in-
cludes vertebrate embryology, microtechnique, and some experimentation. Lecture, two cludes vertebrate embryology, microtechnique, and some experimentation. Lecture, two hours; laboratory, three hours a week. Laboratory fee: $\$ 35$,
Prerequisite: Bio 121-122, 223-224, or permission of instructor.


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Recommended Course Sequence for a Degree in Business Administration

| First Semester |  | Second Semester |
| :---: | :---: | :---: |
| Eng 101 Composition I | 3 | Eng 102 Composition II |
| Core Requirements | 6 | Core Requirements |
| Mth 101 Fundamentals* | 3 | Mth 102 Fundamentals* |
| CS 115 Survey of Computers | 3 | SCT 101 Public Speaking |
| PE 100 Activity | 0 | PE 100 Activity |
|  | 15 |  |
| Third Semester |  | Fourth Semester |
| Acc 121 Accounting I | 3 | Acc 122 Accounting II |
| BA 231 Business Law I | 3 | BA 232 Business Law II |
| Ec 101 Economics I | 3 | Ec 102 Economics II |
| Core Requirements | 6 | Core Requirements |
| PE 100 Activity | 0 | PE 100 Activity |
|  | 15 |  |
| Fifth Semester |  | Sixth Semester |
| BA 209 Business Correspondence | 3 | BA 222 Marketing |
| BA 251 Management | 3 | BA 252 Operations Management |
| Ec 201 Money and Banking | 3 | or BA 254 Organizational Design |
| Ec 231 Statistics I | 3 | Ec 232 Statistics II |
| Core Requirements | 3 | Core Requirements |
| Free Electives | 3 |  |
|  | 18 |  |
| Seventh Semester |  | Eighth Semester |
| BA 225 Finance | 3 | SOBE Electives |
| SOBE Electives | 6 | Free Electives |
| Free Electives | 6 |  |
|  | 15 |  |

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 204 <br> BA 220 <br> BA 226 <br> BA 240 <br> BA 241 <br> BA 395- <br> BA 398 <br> CS 115 <br> CS 124 | Vianagerial Accounting <br> Real Estate <br> Investments <br> Property Insurance <br> Life Insurance <br> 396 Independent Research Topics <br> Survey of Computers and Data Processing or <br> COBOL Programming* | Ec 224 Ec 225 <br> Ec 226 <br> Ec 236 <br> Ec 241 <br> Ec 251 <br> Ec 252 <br> Mth 105 Mth 106 <br> PS 316 <br> SCT 206 | Economic Development International Trade International Investment and Finance <br> Public Finance <br> Microeconomics I <br> Macroeconomics I <br> Macroeconomics II <br> Introductory Calculus I <br> Introductory Calculus II <br> Government Budgeting <br> Business and Professional Speaking |
| :---: | :---: | :---: | :---: |
| ECONOMICS |  |  |  |
| BA 212 <br> CS 115 | Government and Business Survey of Computers and Data Processing or | Ec 228 | Economic Geography of Asia, Africa, and Latin America Comparative Economic Systems |
| CS 123 | FORTRAN Programming* | Ec 230 | Business Cycles |
| Ec 222 | American Labor Movement | Ec 236 | Public Finance |
| Ec 223 | Collective Bargaining | Ec 241 | Microeconomics I |
| Ec 224 | Economic Development | Ec 245 | Consumer Economics |
| Ec 225 | International Trade | Ec 251 | Macroeconomics I |
| Ec 226 | International Investment and | EC 252 | Macroeconomics II |
| Ec 227 | Economic Geography of North | Ec 397 | Seminar |
|  | America, Europe, and the | Ec 398 |  |
|  | Soviet Union | Mth 105 | Introductory Calculus I |
|  |  | Mth 106 | Introductory Calculus II |

MANAGEMENT AND INDUSTRIAL RELATIONS

| Acc 201 | Cost Accounting | CS 115 | Survey of Computers and |
| :---: | :---: | :---: | :---: |
| Acc 204 | Managerial Accounting |  | Data Processing or |
| BA217 | Logistics and Distribution | CS 124 | COBOL Programming* |
|  | Management | Ec 222 | American Labor Movement |
| BA240 | Property Insurance | Ec 223 | Collective Bargaining |
| BA241 | Life Insurance | Mth 105 | Introductory Calculus I |
| BA252 | Operations and System | Mth 106 | Introductory Calculus II |
|  | Management or | Mth 262 | Operations Research |
| BA254 | Organizational Design and | PS 218 | Public Administration |
|  | Behavior** | PS 318 | Public Personnel Administration |
| BA 256 | Business Policies and | Psy 232 | Human Behavior |
|  | Corporate Responsibility | Psy 243 | Industrial Psychology |
| BA271 | Human Resources Management | Soc 265 | Sociology of Work |
| BA 395 | . 398 Independent Research | SCT 202 | Interpersonal Communication |
|  | Topics | SCT 206 | Business and Professional |
|  |  |  | Speaking |

SCT 303 Organizational Communication

## MARKETING

| BA 114 | Salesmanship |
| :--- | :--- |
| BA 216 | Advertising |
| BA 217 | 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 |
| CS 115 | Survey of Computers and |
|  | Data Processing or |
| CS 123 | FORTRAN Programming or |

CS 124 COBOL Programming*
CS 1224 COBOL Programming ${ }^{*}$
EC 224 Economic Developm
Ec 226 International Investment and Finance
Ec 245 Consumer Economics
Mth 105 Introductory Calculus
Mth 106 Introductory Calculus II
sy 232 Human Behavio
STT 202 Interpersonal Communication
SCT 206 Business and Professional Speaking
CS 123 FORTRAN Programming or

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 o Asia, Africa, and Latin America
Ec 229 Comparative Economic Systems
BA 252 Operations and System 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 Anthropolog
Two semesters of a Foreign Language at
the 204 competency. concentration elective
-BA 252 or BA 254 may not be used to satisty both the Business Adminisitration core and serve as a concentration elective
ny of the following History courses, to ? maximum of six credits:
Hst 328 United States Foreign Policy Hst 356 Europe In the Twentieth Century Hst 361-362 History of the Far East Hst 382 History of Latin America Hst 348 History of Russia
Any of the following Political Science courses, to a maximum of six credits: PS 105 Comparative Government
PS 202 International Relations
PS 323 Democratic Systems
PS 324 Communist Systems
PS 325 Politics of Developing Areas

Business Administration Minor (Prerequisite: Ec 101, 102)
( 24 credits, including Ec 101, 102)

1. Finance

Required: Acc 121 Elementary Acc I BA 225 Managerial Finance Acc 122 Elementary Acc II BA 226 Investments
Electives: Two of the following
Ec 201 Money and Banking Ec 236 Public Finance
Ec 226 International Investment BA 241 Life Insurance and Finance

## 2. Marketing

Required: BA 222 Principles of Marketing
Electives: Five of the following:

$$
\begin{array}{lll}
\text { BA 114 } & \text { Salesmanship } & \text { BA 261 }
\end{array} \text { Principles of Retailing }
$$

## \& Sales

3. Management

Required: Acc 121 Elementary Acc I Acc 122 Elementary Acc II

Electives: Two of the following:
BA 225 Managerial Finance
BA 252 Op. Sys. \& Mgmt
BA 256 Bus. Pol. \& Corp Responsibility

BA 251 Principles of Management BA 254 Organiz. Design \& Behavior

BA 271 Human Resources Management 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 252 Op. Sys. \& Mgmt.
Ec 231 Statistics I
Ec 232 Statistics II
Electives: Three of the following:
BA 217 Logistics
Ec 241 Microeconomics
Ec 242 Advanced Microeconomics Mth 262 Operations Research

## BA 101. JNTRODUCTION TO BUSINESS

## Three credits

 cconomy. Stress is placed on organization and management of the enterprise, decision-making within the enterprise, small business operations, and problems of financial resources.

BA 114. 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, presenta, closing, follow-through including sales demonstration.

BA 209. BUSINESS CORRESPONDENCE AND REPORTS
Three credits
An emphasis on written communications: practice in writing major classification of business etters, persuasive requests and refusals, inquiry, order, sales, application, credit, collection, and goodwill letters. Investigative techniques of research and analytical report writing.

BA 212. GOVERNMENT AND BUSINESS 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
and public enterprise.

BA 216. ADVERTISING advertising; a study of the elements of product and market analysis; the elements of advertising layout, appeals, copy, art, display, trademarks, and various media.
BA 217. 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.

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 The fundamentals and functions of the marketing system, its institutions and their importance in the economy are studied; marketing pricing policies and practices are investigated; reference is made to marketing activities and government participation.

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.

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.

BA 231. BUSINESS LAW - INTRODUCTION,
CONTRACTS, AND SALES
The foundation for all subjects in the field of business law. The nature, Three credits The foundation for all subjects in the field of businss law. The assification, and sources of law. Examination of the essential elements of a contract and the nature of conirad
rights under both the common law and the Uniform Commercial Code. A study of the law of sales of goods: the transfer of title and risk of loss, warranties and product liability, and secured transactions.

BA 232. BUSINESS LAW - AGENCY, PARTNERSHIPS,
CORPORATIONS, AND REAL PROPERTY
Three credits A study of the principles of law governing partnerships and corporations, with respect to for mation, operation, internal relationships, and dissolution, as well as the advantages and disad vantages of these forms of business association. A survey of the law of real property, nature and types of interests in land. A discussion of deeds and their prerequisites.

BA 234. BUSINESS LAW - PROPERTY Three credits The law of real property, nature and types of interests in land. A discussion of deeds and their prerequisites. The rights and duties of the landowner to the public. Rights of the government versus rights of the landowner. The landlord-tenant relationship, the mortgagor-mortgageerelationship.

BA 240. PROPERTY INSURANCE
Three credits This course is a study of the fundamentals of fire, casualty, and marine insurance

BA 241. LIFE INSURANCE
Three credits This course is a study of the principles, practices, and uses of life insurance from the overall viewpoint of the product, cost, market, and industry.

BA 251. PRINCIPLES OF MANAGEMENT Three credits Nature and evolution of management thought. Fundamental universal concepts covered: deci-sion-making, policy formulation, planning, organizing, staffing, actuating, communication, directing, controlling, etc. Views management as process of integrating knowledge developed
BA 252. 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.

BA 254. 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.

BA 256. BUSINESS POLICIES AND
CORPORATE RESPONSIBILITY Three credits Integration of background acquired by the student to policy issues. Study of current ideologies and ethics within the institutional framework of the capitalist tradition. Discussion of actual cases.

BA 261. PRINCIPLES OF RETAILING Three credits A basic course that discusses opportunities in retailing; types of retail institutions; problems of and functions of all store divisions.

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.

BÁ 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.

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 198/298/398. TOPICS
Variable credit
Lectures on subjects of special current interest in business which are not covered in other courses.

## CHEMISTRY

Professor Swain, Chairman; Professors Bohning, Faut, Rozelle, Salley, Stine; Assistant Pro fessor Chebolu; Adjunct Professor Hayden; Instructor Cohen; Laboratory Manager Bianco.

Total minimum number of credits required for a B.S. degree -128 . Total minimum number of credits required for a B.A. degree - $\mathbf{1 2 3}$. Total minimum number of credits required for a minor -22 .

The chemistry curriculum is designed to provide a comprehensive back ground 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 advisers.

A minor in Chemistry consists of the completion of 22 credits in chemis try, 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 Degree in Chemistry

| First Semester |  |  | Second Semester |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | B.A. | B.S. |  | B.A. | B.S. |
| Chm 115 Elements and Compounds | 4 | 4 | Chm 116 The Chemical Reaction | 4 | 4 |
| Eng 101 Composition I | 3 | 3 | Eng 102 Composition II | 3 | 3 |
| Mth 111 Calculus I | 4 | 4 | Mth 112 Calculus II | 4 | 4 |
| Core Requirements | 6 | 6 | CS Elective | 3 | 3 |
| PE 100 Activity | 0 | 0 | Free Electives | 3 | 3 |
|  |  |  | PE 100 Activity | 0 | 0 |
|  | 17 | 17 |  | 17 | 17 |

Third Semester

| Third Semester |  |  |
| :--- | ---: | ---: |
|  | B.A. | B.S. |
| Chm 231 Organic <br> Chemistry I | 4 | 4 |
| Chm 222 Systematic <br> Inorganic Chemistry | 4 | 4 |
| Mth 211 Intro. Linear <br> Algebra and Differential | 4 | 4 |
| Equations <br> Core Requirements <br> PE 100 Activity | 3 | 3 |
|  | $\mathbf{0}$ | 0 |
| 15 | $\overline{15}$ |  |


| Fourth Semester |  |  |
| :--- | ---: | ---: |
|  | B.A. | B.S. |
| Chm 232 Organic | 4 | 4 |
| Chemistry II |  |  |
| Chm 241 Inorganic <br> Quantitative Analysis | 4 | 4 |
| Mth 212 Multivariable <br> Calculus <br> Phy 201 General | - | 4 |
| $\quad$ Physics I |  |  |
| Core Requirements | 4 | 4 |
| PE 100 Activity | 3 | - |
|  | $\frac{0}{15}$ | $\frac{0}{16}$ |


| Fifth Semester |  |  |
| :--- | ---: | ---: |
| Chm 251 Physical <br> Chemistry I <br> Chm 276 The History and <br> Literature of Chemistry <br> Phy 202 General | 3 | B.S. |
| Physics II <br> Core Requirements | 4 | 4 |


| Sixth Semester |  |  |
| :--- | ---: | ---: |
|  | B.A. | B.S. |
| Chm 252 Physical | 4 | 4 |
| Chemistry II |  |  |
| Chm 274 Chemical <br> Structure Determination | - | 4 |
| Phy 203 General <br> Physics III <br> Core Requirements | 3 | 3 |
|  | $\frac{9}{16}$ | $\frac{6}{17}$ |


| Seventh Semester |  |  |  | Eighth Semester |  |  |
| :--- | ---: | ---: | :--- | ---: | ---: | ---: |
|  | B.A. | B.S. |  | B.A. | B.S. |  |
| Chm 325 Advanced | - | 3 | Major Electives | 3 | 3 |  |
| $\quad$ Inorganic Chemistry |  |  | Chm 397 Seminar | 1 | 1 |  |
| Chm 397 Seminar | 1 | 1 | Free Electives | 3 | 3 |  |
| Major Electives | 3 | 3 | Core Requirements | $\frac{6}{9}$ | $\frac{9}{13}$ |  |
| Free Electives | 6 | 3 |  |  |  |  |
| Core Requirements | $\frac{6}{16}$ | $\frac{6}{16}$ |  |  |  |  |

Summary of

## Credit distribution

Chemistry Credits B.A. B.S.
Mathematics Credits
Physics Credits
Core Credits
Computer Science Credits
Free Elective Credits
Total Credits
B.A. degree students m
chemistry department.
B.S. degree students must elect a minimum of two 300 -level chemistry courses in addition to the required 300 -level courses.
Seminar and Cooperative Education may not be counted as an advanced 300 -level chemistry elective.
Independent Research (Chm 395-396) may be counted as one advanced 300-level chemistry elective if six credits are taken.
All chemistry majors must complete three credit-hours of Computer Science courses.
The Chemistry Department strongly recommends that students elect a foreign language to satisty one of the core humanities requirements. The language of choice should be German, Russian, or French in that order of priority.
The Chemistry Department strongly recommends that students elect SCT 101, Public Speaking.
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 ourse
Prerequisite for Chm 102, Chm 101.

## CHM 111. INTRODUCTION TO CHEMICAL REACTIONS

 AND PRINCIPLESFour credit
Three major areas of emphasis will be developed: descriptive inorganic chemistry; acids, ba ses, 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 weel 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; prob-
lem 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; labora tory, three hours a week; problem session, one hour a week. Fee: $\$ 35$.
Prerequisite: Chm 115.
CHM 118. CHEMISTRY FOR ENGINEERS
Three credit
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 222. SYSTEMATIC INORGANIC CHEMISTRY
Four credits A systematic description of the chemistry of the main group elements based on fundamental A systematic description of the chemistry of the main group elements based on fundamental
chemical principles. Fundamental techniques of inorganic synthesis. Class, three hours week; laboratory, three hours a week. Fee: $\$ 35$.
Prerequisite: Chm 116.
CHM 231. ORGANIC CHEMISTRY I
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 ples underlying the mysterious vital force from which ali 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
A continuation of Chm 231 with emphasis on modern organic syntheses. The laboratory inte grates 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 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
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: $\$ 35$
Prerequisite: 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; labora tory, three hours a week. Fee: $\$ 35$.
Prerequisite: Chm 251.

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CHM 274. CHEMICAL STRUCTURE DETERMINATION Four credits A study of structure determination techniques with emphasis on organic, inorganic, and biochemical molecules. Techniques include nuclear magnetic resonance, infrared, ultraviotet, visible, and mass spectroscopy, with applications of group theory to spectroscopic investigations. Fee: \$45.
Prerequisite: Chm 222, 232, 251.
CHM 276. THE HISTORY AND LITERATURE OF CHEMISTRY Three credits The nature and use of the important sources of chemical information. The historical foundation of modern chemistry is considered through the development of the literature. Laboratory problems emphasize techniques of information retrieval from journals, abstracts, and other source two hours a week; library laboratory, three hours a week.
Prerequisite: Completion of twenty-four chemistry credits.
CHM 325. ADVANCED INORGANIC CHEMISTRY
Three credits Introduction to ligand field theory; chemistry of the first transition series, organometallic, and II acceptor compounds; mechanisms of inorganic reactions.
Prerequisite: Chm 222 and 252.
CHM 335. ADVANCED ORGANIC CHEMISTRY Three credits An intensive treatment of the concepts of physical organic chemistry with emphasis on the mechanisms of homogeneous organic reactions and the physiochemical methods for determining the structure of organic molecules
Prerequisite: Chm 232.
CHM 344. ADVANCED ANALYTICAL CHEMISTRY Four credits The theory and application of modern techniques and instrumental procedures, such as spectrophotometric, electro-analytical, and chromatographic. Theory and practice of analysis of more complex materials. Class, two hours a week; laboratory, six hours a week. Fee: \$45.
Prerequisite: Chm 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 356. ADVANCED PHYSICAL CHEMISTRY Three credits A detailed examination of statistical thermodynamics, advanced kinetics, quantum theory, and spectroscopy.
Prerequisite: Chm 252.
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 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 276.

CHM 397. SEMINAR One credit
Presentations and discussions of selected topics in chemistry conducted by senior chemistry majors, staff, and visiting lecturers. All chemistry majors are encouraged to attend the meetings.
Prerequisite: Approval of department chairman is required.
CHM 198/298/398. TOPICS
Variable credit
A study of topics of special interest not extensively treated in regularly offered courses.
Prerequisite: Permission of instructor.
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 chairman.

COMPUTER INFORMATION SYSTEMS
Professor Sours, Chairman.
Total minimum number of credits required for a B.S. degree - $\mathbf{1 2 2}$.
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.

Minor in Management Information Systems Required courses

CS 124, CS 224, CS 324, and CS 325 BA 251
Any two among:
BA 252 , BA 254 , BA 256

Required courses for a Computer Information Systems major are indicated in the following recommended curriculum outline.

## Recommended Course Sequence for a <br> Degree in Computer Information Systems

NOTE: All core requirements should be chosen to satisfy the General Core Requirements listed on pages 46-47

## First Semester

Eng 101 Composition I
CS 115 Survey of Computers
Data Processing
Mth 105 Calculus for Life,
Managerial, and Social Sciences I
Acc 121 Elementary Accounting I
Core Requirements
PE 100 Activity

Third Semester
CS 224 Advanced COBOL
and File Management
BA 251 Principles of Managemen Mth 150 Elementary Statistics
Core Requirements
PE 100 Activity

Fifth Semester

## CS 324 Systems Analysis

 BA 225 Managerial Finance Core RequirementsSeventh Semester
CS/Mth Elective*
SCT 101 Public Speaking
Eng 202 Technical Writing Free Electives

Second Semeste Eng 102 Composition II CS 124 COBOL Programming Mth 106 Calculus for Life,
Managerial, and Social Sciences II Acc 122 Elementary Accounting II Core Requirements PE 100 Activity

Fourth Semester CS 123 FORTRAN Programming BA 252 Operations and Systems Management
Core Requirements
PE 100 Activity

Sixth Semester
CS 325 Database Management BA 222 Marketing Core Requirements

Eighth Semester

## CS/Mth Elective*

BA 254 Organizationa
Design \& Behavior (or)
BA 256 Business Policies \& Corporate Responsibility Free Electives

Summary of Minimum Credit Distribution for the CIS Major
credit hours

CS 115, 123, 124, 224, 324, and 325
Mth/CS Electives
Acc 101-102, BA 222, 225, 251, and 252
PA 254 or BA 256
Mth 105, 106, and 150
Eng 101-102
11

Eng 202
Core Electives
Free Electives
$\frac{15}{122}$


## COMPUTER SCIENCE

Professor Sours, Chairman; Professor Emeritus Richards; Professors Merrill, Tillman, Wong; Associate Professors Berard, Decosmo, Earl, Koch, Salsburg; Assistant Professors Anderson, Simmons; Instructors Kenney, Plavchak

Total minimum number of credits required for a B.A. degree -123 . Total minimum number of credits required for a B.S. degree $\mathbf{- 1 2 5}$. Total minimum number of credits required for a minor -22 .
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 156), and in computer information systems and management information systems (see page 93 ).

The Computer Science curriculum consists of theoretical as well as appli-cation-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.

A minor in Computer Science consists of the following:

## Required courses

 CS 123, CS 124, CS 225, CS 227Electives: any one of the following matched triples:

$$
\text { a. CS } 224, \operatorname{CS} 324, \mathrm{CS} 325
$$

b. CS 230, CS 262, CS 321
c. CS 230, CS 320, CS 329
d. CS 230, CS 323, CS 327
e. CS 230, CS 323, CS 328
f. CS 230, CS 326, CS 330
g. CS $230, \mathrm{CS} 328, \mathrm{CS} 364$

Required courses for a computer science major are indicated in the following recommended curriculum outlines, which are based on an extensive prerequisite structure

## Recommended Course Sequences for a

 Degree in Computer ScienceNOTE: All core requirements should be chosen to satisfy the General Core Requirements listed on pages 46-47, except that science electives must be in accordance with the Department's requirements specified on page 98.

| First Semester |  |  | Second Semester |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | B.A. | B.S. |  | в.A. | B.S. |
| Mth 111 Calculus I | 4 | 4 | Mth 112 Calculus II | 4 | 4 |
| Eng 101 Composition I | 3 | 3 | Eng 102 Composition II | 3 | 3 |
| CS 123 FORTRAN | 3 | 3 | CS 225 Advanced | 4 | 4 |
| Programming |  |  | Programming-Pascal |  |  |
| Core Requirements | 6 | 6 | Core Requirements | 6 | 6 |
| PE 100 Activity | 0 | 0 | PE 100 Activity | 0 | 0 |
|  | 16 | 16 |  | 17 | 17 |

## Third Semester

|  | B.A. | B.S. |
| :--- | ---: | ---: |
| Mth 202 Set Theory <br> and Logic | 3 | 3 |
| CS 227 Computer Data <br> Structures | 3 | 3 |
| CS 124 COBOL <br> Programming | 3 | 3 |
| Core Requirements <br> PE 100 Activity | 6 | 6 |
|  | 0 | $\underline{15}$ |
| 15 |  |  |

Fourth Semester Mth 214 Linear Algebra 3 CS 230 Machine Language Science Elective ${ }^{\text {I }}$ Core Requirements PE 100 Activity

Fifth Semester

|  | B.A. | B.S. |
| :--- | ---: | ---: |
| Mt/CS Electives ${ }^{2}$ | 3 | 6 |
| Science Elective $^{1}$ | 3 | 4 |
| Core Requirements | 6 | 6 |
| Free Electives | $\frac{3}{15}$ | $\frac{-}{16}$ |

Seventh Semeste

|  | B.A. | B.S. |  |  | B.A. | B.S. |
| :--- | ---: | ---: | :--- | ---: | ---: | ---: |
| luth/CS Electives |  |  |  |  |  |  |

See page 98 tor the Department's requirements regarding science electives.
2 See page 98 tor the Department's requirements regarding Mith/CS electives.

## Science Electives for Computer Science Majors:

B.A. candidates: Any three courses, including a two-semester sequence, in Biology, Chemistry, Earth and Environmental Sciences, or Physics.
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.)

Mathematics/Computer Science Electives for Computer Science Majors
B.A. candidates: Two of the following courses: CS 262,321 , or 324 ; and Any two Mth or CS courses numbered above 200
B.S. candidates: Two of the following courses: CS 320, 323, 326, 328, or 330; and
Any three Mth or CS courses numbered above 200.

\section*{Summary of Minimum Credit Distribution for Computer Science Majors: <br> | B.A. | B.S. |
| ---: | ---: |
| 14 | 14 |
| 16 | 16 |
| 12 | 15 |
| 9 | 11 |
| 6 | 6 |
| 33 | 33 |
| $\frac{33}{123}$ | $\underline{30}$ |}

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 (Apple II, Macintosh, IBM-PC). Includes some BASIC programming and a survey of current commercial software (Multiplan, Minitab, word processing. etc.). 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 .
Offered every fall and spring.
CS 122. BASIC PROGRAMMING
One credit
Introduction to computer programming using the BASIC language, the principal high level Introduction to computer programming using the BASIC language, the principal high lever
language of microcomputers and processors. A maximum of three credits will be allowed for this course and Mth 102. Not open to students who have prior credit in CS 123. Fee: $\$ 30$. (same as Egr 241)
Offered every summer

CS 123. FORTRAN PROGRAMMING
Structured programming, algorithm design, and introduction to programming using FOR TRAN 77. The computer is used to solve problems from a variety of fields. Fee: \$45. (same a Egr 244)
Prerequisite: Secondary mathematics including geometry and algebra II.
Offered every fall, spring, and summer.
CS 124. COBOL PROGRAMMING
Three credits Introduction to computer programming using the American National Standard Common Busi ness Oriented Language. The computer is used to solve problems commonly found in a busi ness environment. Fee: $\$ 45$
Offered every fall, spring, and summer.
CS 224. ADVANCED COBOL AND FILE MANAGEMENT Three credit A study of advanced programming techniques using ANS COBOL. Topics include efficiency lechniques, modular programming, table searching, indexed, direct, and relative file tech niques. Fee: $\$ 45$.
Prerequisite: CS 124.
Offered every spring and summer
CS 225. ADVANCED PROGRAMMING - PASCAL Four credits A study of advanced programming techniques and the Pascal programming language. Topics include basic and user-defined data types, their use and their machine implementation, struc tured programming, recursion, efficient data organization. Fee: \$45. (same as Egr 245)
Prerequisite: CS $123 / \mathrm{Egr} 244$.
Offered every spring and fall
CS 227. COMPUTER DATA STRUCTURES
A study of the use of a high-level language to implement complex data structures and their Aplicaion losoring and searching. These structures include lists, trees, graphs, networks and storage allocation. Fee: \$45. (same as EE 343)
Prerequisite: CS $225 / \mathrm{Egr} 245$.
Offered every fall.
CS 230. MACHINE LANGUAGE
Basic principles of assembly language programming. Computer organization and representaion 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 225/Egr 245.
Offered every spring.
CS 260. LINEAR PROGRAMMING
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)
Prerequisite: Mth 106 and CS 123.
Offered in the fall semester of odd years.
CS 262. OPERATIONS RESEARCH
A survey of operations research topics such as decision analysis, inventory models, queueing models, dynamic programming, network models, heuristic models, and non-linear program ming. (same as Mth 262)
Prerequisite: CS 123; Mth 105-106 or Mth 111-112; and some elementary knowledge of matrices.
Offered every spring.

CS 320. LOGIC AND SWITCHING CIRCUIT
Application of Boolean algebra to the design of Number system logic networks, solid-state witching circuits and devices. Minimization techniques to the synthesis of combinatorid witching 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 21
Offered every fall.
CS 321. SIMULATION AND DATA ANALYSIS
Three credits
Methods of handling large data bases including statistical analysis and computer simulations. Methods of handling large data bases including statistical analysis and computer simulations. languages, GPSS, GASP, SIMSCRIPT, and/or SLAM.
Prerequisite: CS 224 or CS $225 / \mathrm{Egr} 245$ 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 anguages, push-down automata, turning machines and computability
Prerequisite: Mth 202 and CS 225/Egr 245
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. DATA BASE MANAGEMENT
Three credits
Practical experience in solving a large-scale computer problem including determination of data requirements, appropriate data organization, data manipulation procedures, implementation, esting and documentatio
Prerequisite: CS 324
Offered every spring
CS 326. OPERATING SYSTEM PRINCIPLES
Three credits
Analysis of the computer operating systems including Batch, Timesharing, and Realtime sysems. Topics include sequential and concurrent processes, processor and storage managemen., resource protection, processor multiplexing, and handing 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 and CS 323
Offered in the spring semester of odd years.

CS 328. ANALYSIS OF ALGORITHMS tion, matrix multiplication and multiplication of real numbers, and various combinatoria gorithms.
Prerequisite: CS 227/EE 343 and Mth 202.
Offered in the spring semester of even years.

## SS 32. MICROCOMPUTER OPERATION AND DESIGN Three credits

 Microprocessor architecture, microcomputer design, and peripheral interfacing. Micropro gramming, software systems, and representative applications. Associated laboratory experiments consider topics such as bus structure, programming, data conversion, interfacing, data cqustion, and 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
放 sors 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.
C 335. ADVANCED DATABASE CONCEPTS
Three credit Acontinuation of CS 325. Concentration on the design of a large scale database system, curren pecial 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
Numerical methods of differentiation, integration, solution of equations and of differentia equations withemphasis on problems that lend themselves to solution using computers. (sam ${ }^{15}$ Mith 364)
Prerequisite: CS 123/EE 244 and Mth 211 or permission of instructor
Offered in the spring semester of odd years.

## S 367. COMPUTER GRAPHIC

 color raster display.Prerequisite: CS 227/EE 343.
Offered in the fall semester of even years.

## CS 370, SPECIAL PROJECTS

The definition, formulation, programming, solution, documentation, and testing of a sophisti ated problem or project under close faculty supervision. The project will be drawn from in dustry, 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 ad maximum of twelve credits in CS 370 and Cooperative Education 301-302-303-30 and a maximum of twelve credits in CS 370 and Cooperative Education 301-302-303-304 ard
Prerequisite: Senior standing and approval of the department.
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

Professor Bohning, Chairman; Professor Cox; Associate Professors Case, Pindzola, Redmond; Assistant Professor Klemow; Adjunct Professors Smith, Toothill.

Total minimum number of credits required for a B.A. $\mathbf{- 1 2 9 .}$
Total minimum number of credits required for a B.S. - 130 . Total minimum number of credits required for a minor -18 .

The Department of Earth and Environmental Sciences has two degree 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 B.S. degree program emphasizes the technical and analysis 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 EES.

The B.A. degree program 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 in the B.A. degree is to satisfy the requirements leading to a Pennsylvania Secondary Teaching Certificate with certification in Earth and Space Science.

A minor can be obtained by students with a demonstrated expertise in Earth and Environmental Sciences as determined by the Earth and Environmental Sciences faculty. The minimum requirement can be met by students who have completed 18 EES credits (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.

## Recommended Course Sequences for a

 B.A. Degree in Earth and Environmental SciencesFirst Semester
Eng 101 Composition
Mth 105 Intro. to Calculus
PE 100 Activity
Bio 121 Modern Biology I
Ec 101 Economics I
PS 102 Intro. to American Politics Ed 101 Practicum in Education Humanities Elective Social Science Elective

## Second Semester

Eug 102 Composition
Mth 106 Intro. to Calculus PE 100 Activity
Bio 122 Modern Biology II
Ec 102 Economics II
PS 105 Comparative Government Ed 102 Practicum in Education Core Arts Elective
Humanities Elective Social Science Elective

## Third Semeste

EES 194 Intro. to Field Study EES211 Physical Geology Phy 105 Intro. to Physics PE 100 Activity
Acc 101 Elementary Accounting I Psy 101 General Psychology I Eng 151 Western World Literature I SCT 101 Fundamentals of Public Speaking PS 218 Intro. to Public Administration Computer Science Elective Humanities Elective

| TECHNICAL <br> WRITING | POLITICAL <br> SCIENCE | BUSINESS <br> ADMIN. | EARTH \& SPACE <br> SCIENCE ED. |
| :---: | :---: | :---: | :---: |
| 3 | 3 | 3 | 3 |
| 4 | 4 | 4 | 4 |
| 0 | 0 | 0 | 0 |
| 4 | 4 | 4 | - |
| - | - | 3 | - |
| - | 3 | - | - |
| - | - | - | 1 |
| 3 | 3 | 3 | 6 |
| $\frac{3}{17}$ | - | - | $\frac{3}{17}$ |
| 17 | $\frac{17}{17}$ |  |  |


| 3 | 3 | 3 |
| :---: | :---: | :---: |
| 4 | 4 | 0 |
| 0 | 0 | 0 |
| 4 | 4 | - |
| - | 3 | - |
| 3 | - | - |
| - | - | 1 |
| - | - | 3 |
| 3 | 3 | 6 |
| $\frac{-}{17}$ | $\frac{-}{17}$ | $\frac{3}{16}$ |

[^1]11

Fourth Semester
EES 230 Ocean Science EES 212 Historical Geology Phy 106 Intro. to Physics
PE 100 Activity
Acc 102 Elementary Accounting II
Ed 203i Special Methods of Teaching in the Sciences
Eng 152 Western World Literature II
Computer Science Elective
Humanities Elective
Statistics Elective
Social Science Elective

## Fifth Semester

Chm 115 Elements \& Compounds
EES 251 Synoptic Meteorology
BA 251 Principles of Management
Eng 201 Advanced Composition
Ed 201 Intro. to Education
Computer Science Elective

## Free Elective

Humanities Elective
Social Science Elective
Political Science Elective

## $\begin{array}{llll}\text { ECHHICAL POLITICAL } & \text { BUSINESS } & \text { EARTH \& SPACE } \\ \text { WRITING SCIENCE ADMIN. } & \text { SCIENCE ED. }\end{array}$

The School of Engineering and Physical Science

| TECHNIICAL <br> WRITING | POLITICAL <br> SCIENCE | BUSINESS <br> ADMIN. | EARTH \& SPAC <br> SCIENCE ED. |
| :---: | :---: | :---: | :---: |
| - | - | 1 | - |
| - | - | - | 3 |
| - | - | - | 15 |
| 3 | - | - | - |
| - | 3 | - | - |
| - | - | 3 | - |
| 3 | 3 | 3 | - |
| 3 | 3 | 3 | - |
| 3 | - | - | - |
| - | - | 3 | - |
| 3 | 3 | 3 | - |
| $\frac{-}{16}$ | $\frac{3}{16}$ | - | - |
| 16 | 18 |  |  |


| 2 | 2 | 2 | 2 |
| :---: | :---: | :---: | :---: |
| - | - | - | 4 |
| - | - | 3 | - |
| 6 | 6 | 6 | 3 |
| 3 | - | - | - |
| - | - | - | 3 |
| 3 | 3 | 3 | - |
| $\frac{-}{14}$ | $\frac{3}{14}$ | $\frac{-}{14}$ | $\frac{-}{12}$ |

## Eighth Semeste

EES 392 Senior Projects II
EES 280 Principles of Astronomy
BA Elective
EES Elective
English Elective
Free Elective
Humanities Elective
Political Science Elective
EES 391 Senior Projects
Ed371 The Individual in the Classroom E380 Professional Semester in Education
Eng 391 Projects in Writing
SCT 101 Fundamentals of Public Speaking
BA Elective
Core Arts Elective
EES Elective
English Elective
Free Elective
Humanities Elective
Political Science Elective

SCIENCE ED

| 3 |
| :--- |
| 15 |
| - |
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| - |
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| $=$ |
| - |
| - |

## Sixth Semester

EES 240 Principles of Environmental Science
EES 252 Climatology
BA 254 Organizational Design \& Behavior Eng 202 Technical Writing
Ed 202 Educational Psychology
PS 354 Administrative Policy-Making
EES Elective
Free Elective
Humanities Elective
Social Science Elective


## Recommended Course Sequence for a

## B.S. Degree in Earth and Environmental Sciences

## First Semester

Eng 101 Composition
Bio 121 Modern Biology
Mth 111 Calculus I
PE 100 Activity
Humanities Elective
Social Sciences Elective

## Second Semester

Eng 102 Composition Bio 122 Modern Biology II Mth 112 Calculus II
PE 100 Activity
Humanities Elective
Social Sciences Elective

## Third Semester

EES 211 Physical Geology EES 194 Intro. to Field Study Egr 111 Intro. to Engineering Phy 105 Introductory Physics PE 100 Activity Humanities Elective

## Fifth Semester

 Chm 115 Elements \& Compounds EES 251 Synoptic Meteorology Phy 221 InstrumentationEES Elective
Social Science Elective

## Seventh Semester

 EES 391 Senior ProjectsEES Elective
Core Arts Elective
Humanities Elective
Free Electives

Fourth Semester
EES 230 Ocean Science Computer Science Elective Statistics Elective Phy 106 Introductory Physics PE 100 Activity Humanities Elective

Sixth Semester Chm 116 Chemical Reaction EES 240 Principles of
Environmental Science
EES Elective
Social Science Elective

## Eighth Semester

EES 392 Senior Projects II
EES Elective Humanities Elective Free Electives

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/ and climate. Intended
recitation. Fee: $\$ 35$.

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 laboralory/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
Four credits luding earth's surface, interior, age, and origin. Three hours lecture and three hours laboratory. Fee: $\$ 40$.

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
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: $\$ 40$.
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: $\$ 40$. 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 lecure and hiree hours laboratory. Fee: $\$ 40$

EES 252. CLIMATOLOGY Three credits
Investigation of controls and classification of climatic patterns. Also, study of data handling lechniques, scales of climatic change, and practical applications of climatological results. Three hours lecture.
Prerequisite: EES 251
EES 280. PRINCIPLES OF ASTRONOMY Topics include orbital mechanics, results of planetary probes, spectra and stellar evolution, and cosmology. Three hours lecture and three hours laboratory. Fee: $\$ 40$
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; regula ions; human health effect; chemical, biological, thermal, and physical management strategies and pollution abatement engineering. Three hours lecture
Prerequisite: Chm 116 or 118 and EES 240.

## EES 320. HYDROLOGY

Three credit
The physical elements and processes which constitute the hydrologic cycle are examined. Top ics include floods and flood control, water resources, water uses, and ground water pollution prens. Two hours lecture and three hours laboratory. Fee: \$40
Prerequisite: EES 211.

## EES 325. DYNAMIC METEOROLOGY

Three credit
Topics include themodynamics; heat, moisture, and momentum transfer; and atmospheric forces and motion fields. Three hours lecture and one hour discussion.
Prerequisite: 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 ani 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 $\$ 50$.
Prerequisite: 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 primar and secondary pollutants, stability and plume behavior, modeling, monitoring, standards, rad ation, and air pollution abatement technology and engineering. Analytical procedures, instru mentation 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: $\$ 50$
Prerequisite: 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. Laborator investigations will consist of in-depth analyses of local lakes and streams. Two hours lecture and three 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 three hours laboratory. Fee: \$40.
Prerequisite: 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 three hours laboratory. Fee: \$40
Prerequisite: EES 211 and Chm 116, or consent of instructor.
EES 381. MINERALOGY
Ionic structure of minerals; physical properties and external form as consequences of structure determination of minerals by physical tests. Two hours lecture and three hours laboratory. Fee. $\$ 40$.
Prerequisite: EES 211 and Chm 111 or 115

EES 391. SENIOR PROJECTS I related fieids 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 related fields under the direction of a staff member. Technical as welf as economical factors wilfbe 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. StuThis course is intended for students affiliated with the Cooperative Education Program. Stu-
dents 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).
Prerequisite: Senior standing and approval of department adviser and chairman.
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. 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.
Prerequisite: Upper-class standing and approval of academic adviser, research adviser and department chairman.

EES 397. SENIOR SEMINAR
One to three credits
Presentations and discussions of selected topics and projects.
Prerequisite: Senior standing.
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.

## ECONOMICS

Professor Emeritus Werner; Professors Farrar, Taylor; Associate Professors DeYoung, Wil liams; Assistant Professor Cordora

Total minimum number of credits required for a B.A. degree -122 Total minimum number of credits required for a minor -24 .

Students who contemplate a major in Economics should discuss career opportunities and preparation for life-long professional goals with their advisors.
Economics 101-102 are required of all majors and give the students opportunities to experience the wide gamut of the field and to visualize where economists put their expertise to productive use. Beyond the Principles courses, majors are encouraged to explore, with their advisors, those sequences which will best prepare them for their objectives. (All majors must take Money and Banking, Economic Statistics, Intermediate Macroeconomics and Intermediate Microeconomics.)
Professional economists are seldom employed with a baccalaureate degree and must anticipate further study at the graduate level. Graduates of the Wilkes program have achieved success in such prestigious universities as the University of Virginia, Cornell, the University of Maryland and the State University of New York.
Economists find that opportunities to put their knowledge to work extend from the private sector of the economy to the public sector, as well as to the not-for-profit sector. Firms that employ economists are to be found not only in banking, insurance, and other financial services, but also in international marketing, manufacturing, and kindred areas. At top levels of managerial professional responsibility, comprehension of economic issues is an absolute necessity.
Selection of Economics as a field of concentration is a rational choice for others than just those who elect to be economists. It is, for example, excellent preparation for students planning to continue their educations at law schools, especially for those who might choose corporation law as a specialty. Attorneys practicing in the public sector, especially in the Federal Trade Commission, the Anti-Trust Division of the Department of Justice, or the Securities and Exchange Commission, find substantial economic background ideal for their specialization.
Because Economics and its literature are so quantitative, substantial course work in mathematics is both desirable and necessary. This preparation should also stress Computer Science knowledge beyond basic requirements. The Economics Faculty at Wilkes suggests a foreign language as a humanities elective.
Undergraduates, even those who have taken no courses in Economics, are welcome to talk with departmental staff to explore the possibilities in this dynamic field.

## Minor in Economics

Students choosing to minor in Economics must choose one of the following four areas and must take Ec 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 Cycle
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 222 The American Labor Movement
Ec 229 Comparative Economic Systems
Ec 230 Business Cycles
Ec 236 Public Finance

Recommended Course Sequence for a Degree in Economics

First Semester
Eng 101 Composition I Mth 105 Calculus I
Core Requirements
CS 115 Survey of Computers
PE 100 Activity

## Second Semester

Eng 102 Composition II 3
Mth 106 Calculus II II

## Third Semester

Ec 101 Economics I
Core Requirements
Free Electives
PE 100 Activity

## Fourth Semester

Ec 102 Economics II
Core Requirements
Free Electives
PE 100 Activity

## Sixth Semester

Ec 232 Statistics II
Major Electives
Free Electives

Eighth Semester
Major Electives
Free Electives

Ec 251 Macroeconomics I
Major Electives
3
Free Electives

## Fifth Semester

Ec 231 Statistics I
Ec 201 Money and Banking Ec 241 Microeconomics I or Ec 251 Macroeconomics I Free Electives

## Seventh Semester

$\stackrel{-}{15}$

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 TRAD
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 gatt; current issues

EC 226. INTERNATIONAL INVESTMENT AND FINANCE
EC 226. INTRNATIONAL INVSTMENT AND FNANCE Three credits tional 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 naA suady and analysi
tions 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 estabish the theoretical basis of Socialism and Communism. Particular stress is placed on the per formance 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.

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 ecoare estimation and test design using sample means and proportions with applications in eco-
nomics, 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 TwoWay 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 $r$ search 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 debs and the budget; fiscal problems of federal, state, and local government; the relation of govenment 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 topic
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 direc tion 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.

[^2]Variable credit

## EDUCATION

Professor J. Bellucci, chairman; Professor Emeritus Hammer; Professors Darte, Fahmy; As sociate Professors Johnson, Placek; Assistant Professors B. Bellucci, Ginsburgh, G. Meyers, Polacheck.

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 College 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 Language, History, Interpersonal and Organizational Communication, Journalism, Mathematics, Philosophy, Physics Political Science, Psychology, Theater Arts, Sociology, or Telecommunications.
Secondary school teaching certification candidates must major in one of the following: Art, Biology, Chemistry, Earth and Environmental Sciences, English, Foreign Language, Mathematics, Physics, Communication or Social Studies. They must also take Ed 101, 102, 201, 202, 203, 371, and 380 Social studies certification candidates who major in history must take twelve credits beyond 101-102 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. Al 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; two science sequences; 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 69 (art) or page 168 (music).
Students interested in preparing for teacher certification must have a cumulative G.P.A. of 2.3 , recommendation by the major department, recom mendation 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 counseling in the Education Department early in their first semester at the College.

Page 116
The College of Arts and Sciences
Recommended Course Sequence for Elementary Education

| First Semester |  | Second Semester |
| :---: | :---: | :---: |
| Eng 101 Composition I | 3 | Eng 102 Composition II |
| Psy 101 General Psychology | 3 | Psy 221 Developmental Psychology |
| Core Requirements | 6-8 | Core Requirements |
| Major Electives | 3-4 | Major Electives |
| PE 100 Activity | 0 | PE 100 Activity |
|  | 15-18 |  |
| Third Semester |  | Fourth Semester |
| Ed 101 Practicum | 1 | Ed 102 Practicum |
| Ed 201 Intro. to Education | 3 | Ed 202 Educational Psychology |
| Ed 301 Health, PE \& Safety | 2 | Ed 302 Children's Literature |
| Mth 103 Math for Elementary School Teachers | 3 | Mth 104 Math for Elementary Education Teachers |
| Core Requirements | 6 | Core Requirements |
| Major Electives | 3 | Major Electives |
| PE 100 Activity | 0 | PE 100 Activity |
|  | 18 |  |



Seventh Semester
Core Requirements Major Electives Free Electives

The College of Arts and Sciences
Page 117
Recommended Course Sequence for 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 | 6-8 | Core Requirements | 6-8 |
| Major Electives | 3-4 | Major Electives | 3-4 |
| PE 100 Activity | 0 | PE 100 Activity | 0 |
|  | 15-18 |  | 15-18 |
| Third Semester |  | Fourth Semester |  |
| Ed 101 Practicum | 1 | Ed 102 Practicum | 1 |
| Ed 201 Intro. to Education | 3 | Ed 201 Educational Psychology | 3 |
| Core Requirements | 9-10 | Core Requirements | 9-10 |
| Major Electives | 3 | Major Electives | 3 |
| PE 100 Activity | 0 | PE 100 Activity | 0 |
|  | 16-17 |  | 16-17 |
| Fifth Semester |  | Sixth Semester |  |
| Core Requirements | 3 | Core Requirements | 3 |
| Major Electives | 6-9 | Major Electives | 6-9 |
| Free Electives | 6 | Free Electives | 6 |
|  | 15-18 |  | 15-18 |
| Seventh Semester |  | Eighth Semester |  |
| Core Requirements | 3 | Ed 371 The Individual in | 3 |
| Major Electives | 6-9 | the Classroom |  |
| Free Electives | 6 | Ed 380 Professional Semester | 15 |
|  | 15-18 |  | 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 Ameri-
can 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 pracice 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
ED 302. CHILDREN'S LITERATURE
Two credils
ED 321. THE TEACHING OF READING
Three credits
ED 322. LANGUAGE ARTS AND SOCIAL STUDIES IN EARLY CHILDHOOD AND ELEMENTARY EDUCATION

ED 323. MATHEMATICS AND SCIENCE IN EARLY CHILDHOOD AND ELEMENTARY EDUCATION ments 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 preschool institution.

ED 370. SPECIAL PROJECTS
ED 371. THE INDIVIDUAL IN THE CLASSROOM
This course examines instructional strategies that recognize individual differences, including physical and other handicaps, multi-ethnicity, legal obligations and other classroom responsibilities.
Prerequisite: Enrollment in Ed 380
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
ED 382. INTERN TEACHING
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 198/299/398. TOPICS IN EDUCATION
Variable credit
A study of topics of special interest not extensively treated in regularly offered courses.

## ENGINEERING

Professor Nejib, Chairman; Professor Emeritus Thomas; Professors Faut, Hostler, Kaska Orehotsky; Associate Professors Armand, Arora, Case, Koch, Maxwell, Parashar, Pindzola Assistant Professors Choudhry, Farooq, Ghorieshi, Janaswamy, Janecek, Kucirka, Mohsen Razavi, Srinivasan, Yeroushalmi; Adjunct Professors Fredrick, Osadchy; Lecturer Petyak Technical Support Staff: Chesny, Lennox, Sarnecki, Sickler

Total minimum number of credits required for a B.S. degree in Electrical Engineering - 134 .
Total minimum number of credits required for a B.S. degree in Environmental Engineering - 133.
Total minimum number of credits required for a B.S. degree in Materials Engineering - 133
Total minimum number of credits required for a B.S. degree in Engineering Management - 133.

The Department of Engineering offers three types of degree programs which provide strong engineering and scientific experience with advanced techniques heavily integrated into the curriculum. Students intending to ma jor 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 Manage ment, Environmental Engineering, and Materials 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 an tenna systems, or telecommunications. Specialization is achieved through the appropriate selection of the technical electives.
Candidates for the Engineering Management degree must declare a pre erence 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 five-year programs in engineering offer the student the opportunityto obtain broader education in the arts and sciences, while completing the requirements for a degree in engineering. Upon successful completion of this program, the student is awarded a B.S. degree in a particular branch of engi neering. A student may elect to enter this program at any time during his or her tenure 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, Industrial, and Mechanical 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 (ACS), 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 exportise 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.

Two-Year Academic Programs
Aerospace Engineering
Civil Engineering
Mechanical Engineering

First Semester
Chm 115 Elements and Compounds Eng 101 Composition I Eng 101 Composition I Introduction to Engineering Egr 111 Introduction
Mith 111 Calculus I PE 100 Activity

## Third Semester

EE 211 Circuit Theory I Egr 231 Statics \& Dynamic Egr 283 Measurement Lab. Mth211 Intro. to Differential Equations Phy 202 General Physics II Liberal Studies

Second Semester Chm 118 Chemistry for Engineers Eng 102 Composition II Eng 102 Composition Egr 244 FORTRAN Phy 201 General Physics PE 100 Activity

## Fourth Semester

Egr 232 Strength of Materials or 224 Heat and Mass Transfer Egr 284 Measurement Lab. II MaE 210 Materials Engineering Mth 212 Multivariable Calculus Phy 203 General Physics III Liberal Studies

## Chemical Engineering

First Semester
hm 115 Elements and Compounds Eng 101 Composition I Egr 111 Introduction to Engineering Mth 111 Calculus PE 100 Activity

## Second Semester

 Chm 118 Chemistry for Engineers Eng 102 Composition II Egr 244 FORTRAN Mth 112 Calculus II Phy 201 General Physics I PE 100 Activity
## ourth Semester

 Chm Elective ( 200 or above) Egr 284 Measurement Lab. II MaE 210 Materials Engineering Mth 212 Multivariable Calculus Phy 203 General Physics III Liberal Studies
## Industrial Engineering

First Semester
Chm 115 Elements and Compounds Eng 101 Composition
Egr 111 Introduction to Engineering Mth 111 Calculus
PE 100 Activity

## Third Semester

EE 211 Circuit Theory I
Egr 231 Statics \& Dynamics Egr 283 Measurement Lab. Mth 211 Intro. to Differential Equations Phy 202 General Physics II Liberal Studies

Second Semester Chm 118 Chemistry for Engineers Eng 102 Composition II Egr 244 FORTRAN Mth 112 Calculus II Phy 201 General Physics I PE 100 Activity

## First Semester

Chm 115 Elements and Compound Eng 101 Composition I
Egr 111 Introduction to Engineering Mth 111 Calculus
PE 100 Activity

## Four-Year Academic Programs

## Recommended Course Sequence for a

 Degree in Electrical Engineeringhird Semester
EE 211 Circuit Theory I

## Fourth Semester

Egr231 Statics \& Dynamics
Egr283 Measurement Lab.
Wth 211 Intro. to Differential Equations
Phy 202 General Physics II 4
Liberal Studies
Second Semester
Chm 118 Chemistry for Engineers 3 Eng 102 Composition II 3 Egr 244 FORTRAN
Mth 112 Calculus II
Phy 201 General Physics I PE 100 Activity

EE 212 Circuit Theory II
Egr 232 Strength of Materials
or 224 Heat Transfer
Egr 284 Measurement Lab. II
MaE 210 Materials Engineering Mth 212 Multivariable Calculus Phy 203 General Pl

Sixth Semester

EE 252 Electronics II
EE 254 Electronic Lab. II
EE 234 Electronic Lab. II EE 332 Electromagnetics II EE 3342 Electromagnetics Lab EE 272 Solid State Devices
EF Elective
Liberal Studies

Eighth Semester
EE 382 Adv. Comm. \& Antenna Lab. EE 392 Senior Projects II
EE Electives
Liberal Studies


## Seventh Semeste

## 321 Electric Machines

EE 323 Electric Machines Lab
EE 335 Microwaves \& Antenna Systems
EE 381 Advanced Microelectronics Lab. 4 EE 391 Senior Projects I
Elective
beral Studies EE 331 Electromagnetics I
E 333 Electromagnetics Lab. EEElective
Liberal Studies

Liberal Studies

[^3]
## Recommended Course Sequence for a <br> \section*{B.S. Degree in Environmental Engineering}

## First Semester

Chm 115 Elements and Compounds
Eng 101 Composition
Egr 111 Introduction to Engineering
Mth 111 Calculus I
PE 100 Activity

## Third Semester

Mth 211 Differential Equation Phy 202 General Physics II Egr 283 Measurement Lab. EES 211 Physical Geology EE 211 Circuit Theory I

## Fifth Semester

Bio 121 Modern Biology I
or Chm 231 Organic Chemistry I
EES 331 Advanced EQM I
or 320 Hydrology
Egr 233 Fluid Mechanics
Egr 231 Statics \& Dynamics Liberal Studies

Second Semester
Chm 118 Chemistry for Engineers Eng 102 Composition II Egr 244 FORTRAN
Mth 112 Calculus II
Phy 201 General Physics I PE 100 Activity

## Fourth Semester

Mth 212 Multivariable Calculus Phy 203 General Physics III Egr 284 Measurement Lab. II EES 240 Principles of Environmental Science
MaE 210 Materials Engineering Egr 224 Heat \& Mass Transfer

## Sixth Semester

Bio 122 Modern Biology II
or Chm 232 Organic Chemistry II EES 332 Advanced EQM II or 305 Hazardous Solid Waste Egr 232 Strength of Materials MaE 234 Electrochemistry or 332 Engineering Polymers Liberal Studies

## Eighth Semester

 Egr 397 Senior Seminar EES 332 Advanced EQM II or 305 Hazardous Solid WasteMaE 234 Electrochemistry
or 332 Engineering Polymers
Technical Elective
Liberal Studies

First Semester
Recommended Course Sequence for a B.S. Degree in Materials Engineering

## Second Semester

## Sixth Semeste

Chm Elective (200 or above)
MaE 332 Engineering Polymers
$3-4$
3
Chm 231 Organic Chemistry I WaE 311 X-Ray Diffraction int or 321 Thermo \& Phase Equilibria MaE 241 Physical Metallurgy or 231 Ceramics
EE 271 Physical Electronics 3
ical Electronic
Liberal Studies**

Chm 115 Elements and Compounds 4 Eng 101 Composition I
Egr 111 Introduction to Engineering Mth 111 Calculus I PE 100 Activity

Chm 118 Chemistry for Engineers Eng 102 Composition II
Egr 244 FORTRAN
Mth 112 Calculus II
Phy 201 General Physics I PE 100 Activity

## Fourth Semeste

 Egr 224 Heat and Mass Transfer Egr 232 Strength of Materials Egr 284 Measurement Lab. II Mth 212 Multivariable Calculus Mth 212 Multivariable Calculus MaE 210 Materials Engineering$\begin{array}{r}3 \\ 3 \\ 3 \\ 4 \\ 4 \\ 0 \\ \hline 17\end{array}$

EE 211 Circuit Theory I
Egr 231 Statics \& Dynamics Egr 283 Measurement Lab. 1 Mth 211 Intro. to Differential Equations Phy 202 General Physics II Liberal Studies**
or 322 Thermo \& Phase Equilibria II MaE 342 Mechanical Metallurgy or 234 Electrochemistry MaE Elective*
MaE Elective ${ }^{*}$
3
Liberal Studies** $\quad \frac{3}{15-16}$

Eighth Semester MaE 332 Engineering Polymers a 342 Mechanical Metallurgy or 234 Electrochemistry MaE 392 Senior Projects II MaE Elective*
Liberal Studies**

## Recommended Course Sequence for a B.S. Degree in Engineering Management

## First Semester

Chm 115 Elements and Compounds Eng 101 Composition I Egr 111 Introduction to Engineering Mth 111 Calculus I
PE 100 Activity

## Second Semester

Chm 118 Chemistry for Engineers
Eng 102 Composition II
Egr 244 FORTRAN
Mth 112 Calculus
Phy 201 General Physics PE 100 Activity

Fourth Semester MaE 210 Materials Engineering Egr 232 Strength of Materials Egr 284 Measurement Lab. II Mth 150 Statistics
Acc 101 Accounting
Ec 102 Economics II

## General Engineering

EGR 111. INTRODUCTION TO ENGINEERING
A general introduction to the techniques of engineering analysis. Emphasis on: methods of solving engineering problems; data presentation and interpretation including graphs, schematics, and P.C. layous, fundamentals of dratting and CAD systems, vectors and vectors algebra, Proils solving using computers. Four hours lecture-recitation per week. Fee: $\$ 15$

EGR 224. HEAT AND MASS TRANSFER
Three credits
Fundamental principles of heat transmission by conduction, convection and radiation; applicaFundamental principles of heat transmission by conduction, convection and radiation; applica tion of engineering problems. Three hours lecture per week.
Prerequisite: Phy 201 and Mth 211.
EGR 231. STATICS AND DYNAMICS
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; Newon'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.
EGR 232. STRENGTH OF MATERIALS
Analysis of statically determinate and indeterminate structural systems; computation of reac tions, shears, moments, and deflections of beams, trusses, and frames. Bending and torsion of lender bars; buckling and plastic behavior. Three hours lecture per week.
Prerequisite: Egr 231
EGR 233. FLUID MECHANICS
Three credits
Thermodynamics and dynamic principles applied to fluid behavior, ideal, viscous, and com pressible fluids under internal and external flow conditions
Prerequisite: Egr 231.
EGR 241. BASIC PROGRAMMING Models
BA 231 Business Law - Contracts 3 or 232 Business Law - Corp. Technical Electives* Liberal Studies***

## Eighth Semester

EES 240 Principles of Environmental Science
Technical Electives*
Engineering Management Elective** Egr 392 Senior Projects II

Introduction to computer programming using the BASIC language, the principal high leve language of microcomputers and minicomputers. One hour lecture per week. Fee: $\$ 30$. (see CS 122)

EGR 244. FORTRAN
Three credits Introduction to computer programming using the FORTRAN language. The computer is used 10 solve problems geared to the individual interest of the students. Three hours lecture per week. Fee: \$45. (see CS 123)

EGR 247. ADVANCED PROGRAMMING - PASCAL
A study of advanced programming techniques and the Pascal programming language. Topics A study of advanced programming techniques and the Pascal programming language. Topic tured programming, recursion, efficient data organization. Fee: $\$ 45$. (same as CS 225)
Prerequisite: CS 123/Egr 244.
Offered every spring and fall.
EGR 250. BIOMEDICAL ENGINEERING
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 283-284. ENGINEERING MEASUREMENT LAB I, II One credit eaci A laboratory for the development of measurement techniques and data gathering. The under standing and the use of instrumentation for the measurement of various electric quantities, dil placement, temperature, pressure, and other engineering-related quantities. Two-hour labora tory per week. Fee: $\$ 30$ per semester

EGR 342. MACHINE LANGUAGE
Three credits
Basic principles of machine language programming. Computer organization and representition of numbers, strings, arrays, list structures at the machine level. Examples utilize all levels of computer architecture. Three hours lecture. Fee: $\$ 45$. (see CS 322 )
Prerequisite: Egr 245/CS 223.

## EGR 360. INDUSTRIAL TRAINING

One to six credit
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. Emphz sizes the development of ability in analyzing problems, solving problems by using software and post solution analysis. (same as CS 262)
Prerequisite: Junior standing or consent of instructor.
EGR 372. ENERGY MANAGEMENT ENGINEERING
Three credils Appraisal of energy conservation management, economic efficiency of energy sources, proAppraisal of energy conservation management, economic efficiency of energy sources, pro-
ductivity analysis techniques. Principles of energy balance analysis and the availability of en ergy sources.
Prerequisite: Junior or senior study in engineering or science

## EGR 373. OCCUPATIONAL HEALTH

Three credit
Appraisal of environmental health hazards, sampling techniques, instrumentation and analytic Appraisal of environmental heatth hazards, sampling techniques, instrumentation and anayutic
methods. Principles of substitutions, enclosure and isolation for the control of hazardous oper
ations 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 credils
Description of systems management, systems engineering management and the design proc. ess. 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 enginees and managers.
Prerequisite: Egr 371 or consent of instructor.

EGR 391. SENIOR PROJECTS I rection 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 chairman
GR 397. SEMINAR
One to three credits
Presentations and discussions of selected topics and projects.
Prerequisite: Senior engineering standing.
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 teady-state analysis using phasor Characterizations of inductance and capacitance. Sinusoida seady-state analysis using phasor concept. Average power and r.m.s. values. Reactive power 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 net Inter-relationship between time domain and frequency remponses of second order functions 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, par-
ticularly 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 back. 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 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 Transistor processes and types, properties of semiconductors, junction characteristics and theory. Junction transistor characteristics and theory. High-current effects and low frequency feedback effects. Low frequency and high frequency hybrid parameters. Three hours class a week.

Prerequisite: MaE 210 and Phy 203.
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. ELECTRIC MACHINES
Three credits Magnetic circuits; single and three phase transformers, auto transformers, DC Machines: principle and construction, DC Generators, DC Motors, AC Machines: Synchronous Generators, and motors, Parallel operation, 3 phase and 1 phase induction motors.
Prerequisite: EE 331.

The School of Engineering and Physical Sciences

EE 323. ELECTRIC MACHINE LABORATORY Analysis of single and three phase circuits and the concept of power measurement; no credit load tests on Transformers, DC Machines, Synchronous Machines, and Induction Motors. Three Phase Transformer Connections, Parallel operation of alternators. Fee $\$ 40$. Prerequisite: To be taken along with or after EE 320.

EE 331. ELECTROMAGNETICS I
Three credits Wetor 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.
Prerequisite: 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; im pedance transformation and Smith Charts. Guided TEM, TE and TM waves. Radiation from dipole antenna. Three hours lecture a week.
Prerequisite: EE 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 Fee. $\$ 40$.
Corequisite: EE 331.
EE 334. ELECTROMAGNETICS LABORATORY II One credit A continuation of EE 333 with emphasis on transmission line concepts and the interaction of electromagnetic fields and matter. One three-hour laboratory a week. Fee: $\$ 40$. Prequisite: EE 331

EE 335. MICROWAVES AND ANTENNA SYSTEMS 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 se-
quential 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 experi-
ments consider topics such as bus structure, programming, data conversion, interfacing, data ments 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 in clude 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 245.
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 de vices. 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 commun. ication. 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.
Prerequisite: EE 271 and EE 332.
EE 381. ADVANCED 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. ADVANCED COMMUNICATION AND ANTENNA LAB <br> Four credits

 Characterization and measurement of microwave components, devices, and systems. Empha. sis on testing and design criteria using swept frequency and dynamic techniques. Network and spectrum analyzers. Antenna radiation pattern measurements using the antenna range test facil ity. 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 credi

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
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 chairman 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.

## Materials Engineering

## MAE 210. INTRODUCTION TO MATERIALS SCIENCE

 AND ENGINEERINGThree credits
Application of materials properties to engineering design. Introduction to atomic arrange ments, crystal structures, imperfection, phase diagrams, and structure-property relations Fundamentals of iron, steel, and non-ferrous materials. The behavior of materials in environ mental conditions. Three hours lecture a week
Prerequisite: Phy 201, 202.

## MAE 231. CERAMICS

## Three credits

Structure and properties of ceramic crystalline solids, glasses, and clays. Defect structure alom movement, interfaces, and ceramic phase diagrams. Processing and engineering applica tion of ceramics. Three hours lecture a week.
Prerequisite: MaE 210.

## MAE 234. ELECTROCHEMISTRY

Fundamentals of electrochemistry and the application of electrochemical concepts to corrosion sontrol, baltery 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 metal and alloys. Interaction between microstructure, properties, and engineering design. Threc 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 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 electrochemis try. Electron theory of phase formation. Three hours lecture a week.
Prerequisite: MaE 210
MAE 322. THERMODYNAMICS AND PHASE EQUILIBRIA II
Three credit
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.
Prerequisite:
MaE 321.

MAE 332. POLYMERS
Three credits
Introduction to high polymers as an engineering material. The mechanical, electrical, and opti Introduction to high polymers as an engineering material. The mechanical, electrical, and opti-
cal properties of polymers and polymer applications. Two hours lecture a week and one two cal properties of polymers and polymer applications.
hour laboratory a week. Fee: $\$ 35$. (same as Chm 358)
Prerequisite: MaE 210 and Chm 231.
MAE 342. MECHANICAL METALLURGY
Three credits
The mechanical properties of materials including: elasticity, plasticity, anelasticity, viscoelas ticity, dislocation theory, fracture, fatigue, and deformation of single crystal and polycrystal line 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 laboperimental techniques, energy conversion, transformations. Research.
ratory 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 thermo-
chemical reactions and equilibria by microscopy technique, study the microhardness determichemical reactions and equilibria by microscopy technique, study the microhardness determi-
nation technique of ceramographic specimens. Qualitative and quantitative analysis of an alloy nation 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 or a multi-component oxide. Identification of the components of organic compounds by in
UR, and NMR. Four point probe electrical conductivity and Hall measurements of semi-conUR, and NMR. Four point probe electies study of perovskite and spinel classes of ferromagnetic
ducting materials. Magnetic properties compounds. Applications. One hour lecture and one four-hour laboratory a week. Fee: $\$ 45$. Prerequisite: MaE 210

MAE 391. SENIOR PROJECTS I
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.
:Mrequisite: 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 chairman 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
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


## ENGLISH

Professor Karpinich, Chairman; Professors Emeriti Lord, Marban, Rizzo; Professors Fiester, Gutin, Kaska, Terry; Associate Professor R. Heaman; Instructors Anderson, Hall.

Total minimum number of credits required for a B.A. degree -120 . Total minimum number of credits required for a minor - 18 .

The Department of Language and Literature offers a variety of programs for students interested in language and the arts: they may major in English, in French, in German, or in Spanish. These programs are broadly based in the values traditionally associated with humane learning, and prepare students for such diverse careers as teaching, law, government service, theater, communications, and business

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. They may choose concentrations as follows:

Literature. The concentration in literature requires 24 credit hours in advanced (above 200 -level) literature courses. These must include one course ina major writer, one course in either the novel or drama, one course in American literature, two period courses in English literature before 1900, and one seminar.

Qualified students who concentrate in literature may be invited to 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 $e$ amination.

Writing. The concentration in writing requires 12 credit hours in advanced lit erature courses; Eng 201 and nine additional credit hours in advanced writing courses; and the submission of a portfolio of the student's work.

Linguistics. The concentration in linguistics requires 12 credit hours in advanced literature and writing courses, and Eng 220, 222, 225, and 226.

Students who choose a minor in English are required to take English 151 and 152 and an additional twelve credits in courses beyond the 100 level.

Students may be certified as public school teachers in English with concentrations in literature or writing. Students who seek certification must b especially careful in selecting courses to meet their professional needs They are expected to arrange their programs in close consultation with their advisors.

## Recommended Course Sequence for a Degree in English

## First Semester

Eng 101 Composition !
Core Requirements
PE 100 Activity

## Second Semester

| Eng 102 Composition II | 3 |
| :--- | ---: |
| Core Requirements | 12 |
| PE 100 Activity | $\mathbf{0}$ |
|  | 15 |

## Fourth Semester

 Eng 254 Survey of English Literature Eng 201 Advanced Composition Core Requirement PE 100 ActivitySixth Semester
Eng 225 Transformational Grammar Major Electives* Free Electives

Eighth Semeste
Eng 397
Free Electives
$\begin{array}{r}3 \\ 12 \\ \hline 15\end{array}$
3
12 $\begin{array}{r}12 \\ 0 \\ \hline 15\end{array}$

## Third Semester

 Eng 151 Western World Literature Eng 253 Survey of English Literature Core Requirements PE 100 ActivityFifth Semester
Eng 220 History of the Eng. Language 3 Major Electives* Free Electives

Seventh Semester
Major Electives*
Free Electives

Three credits

## NG 99. ENGLISH AS A SECOND LANGUAGE

Thee credit
ENG 100. WRITING WORKSHOP
Three credits Idevelopmental 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 credit
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. 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.
Prerequisite: Eng 102.
ENG 202. TECHNICAL WRITING
Three credit
A study of the types and strategies of technical writing. Reading and intensive practice. 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
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.
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 Eng
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 A study of the works a 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

## The College of Arts and Sciences

## ENG 305-306. THE TEACHING OF ENGLISH

A study of the problems of teaching the language arts in the secondary schools.
Prerequisite: Eng 152 or 254 and permission of department chairperson.
ENG 310. MEDIEVAL ENGLISH LITERATURE
A study of English literature to 1500, exclusive of Chaucer and the drama. Prerequisite: Eng 152 or 254
ENG 312. CHAUCER
Study of Chaucer's life and 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.
Perequisite: Eng 152 or 254.
ENG 354. ROMANTIC PROSE AND POETRY
Three credits
Study of Blake, Wordsworth, Coleridge, Shelley, Keats, and Byron, with related 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

Study of major British poetry of the twentieth century.
Prerequisite: Eng 152 or 254
ENG 372. MODERN NOVEL
Study of the major novels of the twentieth century Prerequisite: Eng 152 or 254

ENG 374. MODERN DRAMA
Study of important dramatists, European and American, from the time of Ibsen Prerequisite: Eng 152 or 254

ENG 381. AMERICAN LITERATURE I
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 credit
A study of the American novel from its beginning to the present
Prerequisite: Eng 152 or 254
ENG 384. AMERICAN DRAMA
A study of the American drama from the colonial period to the present. Prerequisite: Eng 152 or 254

## ENG 386. MODERN AMERICAN POETRY

 Study of major movements and representative figures in modern American poetr Prerequisite: Eng 152 or 254
## ENG 391-392. PROJECTS IN WRITIN

One to three credit
Independent projects in writing for advanced students.
Prerequisite: Six credits in advanced writing, and permission of department.
ENG 395-396. INDEPENDENT RESEARCH One to three credits Independent study and research for advanced students in the field of the major under the direc tion of a staff member. A research paper at a level significantly beyond a term paper is required. Prerequisite: Approval of department chairman is required

ENG 397. SEMINAR (Maximum of three credits per student) One to three credit Presentations and discussions of selected topics.

Prerequisite: Approval of department chairman is required

## ENG 198/298/398. TOPICS

Variable credi
The study of a special topic in language, literature, or criticism. Possible topics include liter ture and science, Black literature, semiotics, children's literature, literature and film, literature and religion, etc.
Prerequisite: Eng 152 or 254

## FRENCH

Associate Professor Karpinich.
Total minimum number of credits required for a B.A. degree - $\mathbf{1 2 0}$. Total minimum number of credits required for a minor - $\mathbf{1 8}$.

A major in French 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 and 350; and in addition to the required twentyfour credit hours, 390 and English 222. In order to enhance their command of language and their understanding of culture, majors are urged to spend a summer or semester abroad
Students majoring in French may elect 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 Language and Literature, Room 201, Kirby Hall
A minor in French shall consist of eighteen credit hours beyond 102.
Recommended Course Sequence for a Degree in French
First Semester Second Semester

| Eng 101 Composition I | 3 |
| :--- | ---: |
| Fr 101 Elementary I | 3 |
| Core Requirements | 9 |
| PE 100 Activity | 0 |
|  | $\mathbf{1 5}$ |

Third Semester
FF 203 Intermediate I
Core Requirements
PE 100 Activity

Fifth Semester
Fir 205 Conversation
Major Electives
Free Electives

Seventh Semester
Maior Electives
Free Electives

Eng 102 Composition II Fr 102 Elementary II Core Requirements PE 100 Activity

Fourth Semester

## Fr 204 Intermediate II

Core Requirements
PE 100 Activity
0100 Activity $\quad \frac{0}{15}$

Sixth Semester
Fr 206 Advanced Conversation Major Electives
Free Electives

Eighth Semester
Major Electives
Free Electives
6
9

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 text 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 discus sions, 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 expres sion. 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 credit
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 and 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 instructo

## 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 chairman.

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 chairman.

FR 397. SEMINAR
(Maximum of three credits per student) One to three credit Presentations and discussions of selected topics
Prerequisite: Approval of department chairman.
FR 198/298/398. TOPICS
Examination of special topics in French literature. Possible topics include existentialism, sur realism, symbolism, realism and naturalism, the enlightenment, classical drama, the 19th cen tury novel, the nouveau roman, Proust, Baudelaire, and Moliére. May be repeated for credit Prerequisite: Fr 301-302 or permission of instructor

## GERMAN

## Associate Professor Karpinich

Total minimum number of credits required for a B.A. degree - $\mathbf{1 2 0}$ Total minimum number of credits required for a minor - 18 .

A major in German 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 and 350; and in addition to the required twenty four credit hours, 390 and English 222. In order to enhance their command of language and their understanding of culture, majors are urged to spend a summer or semester abroad.
Students majoring in German may elect 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 Language and Literature, Room 201, Kirby Hall
A minor in German shall consist of eighteen credit hours beyond 102

## Recommended Course Sequence for a Degree in German

| First Semester |  |
| :--- | ---: |
| Eng 101 Composition I | 3 |
| Gr 101 Elementary I | 3 |
| Core Requirements | 9 |
| PE 100 Activity | $\mathbf{0}$ |
|  |  |
|  |  |
|  |  |

## Third Semester

Gr 203 Intermediate I Core Requirements
PE 100 Activity

## Second Semester

Eng 102 Composition II Gr 102 Elementary II Core Requirements PE 100 Activity

Fourth Semester
Gr 204 Intermediate II
Core Requirements
PE 100 Activity

Fifth Semester
Gr 205 Conversation
Major Electives
Free Electives

Seventh Semester
Major Elective
Free Electives

Sixth Semester Gr 206 Advanced Conversation Major Electives
Free Electives

## Eighth Semester

## Major Electives

Free Electives

GR 101-102. ELEMENTARY GERMAN
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. Norks 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 <br> Three credits <br> 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, iiterary 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 Exeparation and presentation of instructional materials.
Prerequisite: Senior standing and permission of department chairman
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 chairman.
GR 397. SEMINAR (Maximum of three credits per student) One to three credits Presentations and discussions of selected topics.
Presentations and discussions of selected topics.
Prerequisite: Approval of department chairman.
GR 198/298/398. TOPICS
Variable credit
Examination of special topics in German literature. Possible topics include expressionism, nat Examination of special topics in German literature. Possible topics include expressionism, nat and Kafka. May be repeated for credit.
Prerequisite: Gr 301-302 or permission of instructor

## HEALTH RECORDS ADMINISTRATION

See Health Sciences Programs below.

## HEALTH SCIENCES PROGRAMS

Temple University College of Allied Health Professions and Wilkes College have established affiliated programs to meet the need for increasing numbers of educated, highly skilled health care professionals. The prograins 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 five areas:

## Physical Therapy

Occupational Therapy
Health Records Administration
Medical Technology
Nursing

Successful completion of the selected program at the College of Allied Health Professions will lead to the Bachelor of Science degree from Temple University.

The Allied Health Programs require four years of study. The first two years of study or the equivalent are done at Wilkes College and the final two years at Temple University College of Allied Health Professions. Academic preparation at Wilkes College 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 below.

## Course Requirements for All Students

| Temple University Programs | Credits | Wilkes College Equivalents |
| :--- | :---: | :--- |
| 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

## 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 |
| 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 |

Temple University Programs Credits Wilkes College Equivalents ${ }^{1}$

Science

Social Sciences

Physical Therapy
Science $\quad 8-9 \quad$ Bio 121-122 General Biology 8-9 Phy 105-106 General Phys 6-8 Mth 101-102 Fundamentals of Mathematics OR Mth 105 Analytical Geometry \& Calculus Psy 331 Abnormal Psychology

| Science | 4 | Bio 121 General Biology |
| :--- | ---: | :--- |
|  | 4 | Bio 113 Microbiology |
|  | $3-4$ | Mth 150 Statistics |
|  | $6-8$ | Chm 115-116 Chemistry |
|  | $6-8$ | Bio 115-116 Anatomy \& Physiology |
| Social Science | $3-4$ | Psy 221 Developmental Psychology |
| Humanities | $3-4$ | Language, Philosophy, Literature, |
|  |  | History, Religion, or Music/Art |
|  |  | Appreciation |

STUDENTS ARE STRONGLY URGED TO CONSULT THEIR ACADEMIC ADVISOR TO INSURE THAT THEY ENROLL IN THE APPROPRIATE COURSES

[^4]HISTORY
Professor Berlatsky, Chairman; Professors Emeriti Driscoll, Kaslas, Leach; Professors Cox Hartdagen, Rodechko, Shao; Assistant Professors Bauzon, Behuniak-Long, Berg, Meyers Tuhy; Adjunct Professor Thomas.

Total minimum number of credits required for a B.A. degree -121 . Total minimum number of credits required for a minor - 18 .

Wilkes College requires 121 credit hours for the B.A. degree in history. These include $45-65$ 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.

Normally, History 101-102 will fulfill the core requirement in history. However, students may substitute advanced courses with the written approval of the instructors of the advanced courses or the department chairman.

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 Degree in History

| First Semester |  | Second Semester |
| :---: | :---: | :---: |
| Hst 101 World Civilization I | 3 | Hst 102 World Civilization II |
| Eng 101 Composition I | 3 | Eng 102 Composition II |
| Core Requirements | 9 | Core Requirements |
| PE 100 Activity | 0 | PE 100 Activity |
|  | 15 |  |
| Third Semester |  | Fourth Semester |
| Hst 207 American History I | 3 | Hst 208 American History II |
| Core Requirements | 12 | Core Requirements |
| PE 100 Activity | 0 | Free Electives PE 100 Activity |
|  | 15 |  |

The College of Arts and Sciences
Fifth Semester Major Electives Free Electives

Seventh Semester Major Electives Free Electives

HST 101-102. WORLD CIVILIZATION as course is designed as a survey of all the basic cultures of the world. The major portion of course will be devoted to the development of wester. and in the twentieth century.

HST 207-208. AMERICAN HISTORY Three credits each A general survey of American history from colonial times to the present.

HST 315. ANCIENT HISTORY: NEAR EAST
Three credits The birth of civilization in Mesopotamia and Egypt. Babylonian, Persian, and Judaic backfrounds of western civilization. Attention will also be paid to certain lesser civilizations, with emphasis on the role of archaeology.

HST 316. ANCIENT HISTORY: CLASSICAL WORLD Three credits The direct Greco-Roman antecedents for western civilization will be developed, beginning with Mycenae, through Homer, the Golden Age, Hellenistic world, and the rise and fall of Rome. Emphasis will be on the cultural contributions of each group and period to our present world.

HST 321. AMERICAN SOCIAL HISTORY Three credit 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.

HST 322. AMERICAN INTELLECTUAL HISTORY
This course is a survey of the formative ideas which seem most to have influenceree credits iscourse is a survey of the formative ideas which seem most to have influenced American mineteenth and early twentieth centuries because this period is the time when upon the late were articulated in America.

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

HST 325. AMERICAN ETHNIC HISTORY A study of the institutions and problems that have crized various immigrant Indian communities from colonial times to the present.

HST 326. URBAN HISTORY
A survey of the origins and development of the modern city. Primary emphasis is Three credits evolution of the city in America and its influence on American society and culture. Referenceis made to the cities of modern Europe and Asia primarily for comparative purposes.

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.

HST 331. COLONIAL AMERICA Three credits Discovery, exploration, and settlement; development of social, political, religious, and intellectual institutions; independence and political reorganization.

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.

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.

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.

HST 335. THE UNITED STATES SINCE 1945
Three credits An examination of the political, social, and economic changes in the United States since Word 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.

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.

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.

HST 351. MEDIEVAL EUROPE
Three credits Consideration will be given to political, economic, and cultural institutions and activities, and intellectual development in Medieval Europe to the early Renaissance.

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.

HST 353. AGE OF ABSOLUTISM Three credis The political, social, economic, intellectual, and cultural development of Europe and dependencies from 1600 to about 1750 .

HST 354. THE ERA OF THE FRENCH REVOLUTION
AND NAPOLEON
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

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.

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.

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.

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.

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.

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.

HST 367. HISTORY OF MODERN INDIA HST 367. HISTORY OF MODERN INDIA Three credits
A study of the political, social, and economic development of the Indian sub-continent since 1500.

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.

HST 382. HISTORY OF LATIN AMERICA Three credits This course is a survey of the development of Latin American political, cultural, and economic life, from ancient times, through the Iberic colonization and period of independence, to the tumultuous era of the mid and late 20th century.

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.

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 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 College. In addition, credit may be assigned for appropriate off-campus study, work, and 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 120 credits. Although there are no specific course requirements, the spirit of the Wilkes College core curriculum is to be respected.


## INTERNATIONAL STUDIES

Assistant Professor Tutwiler, International Studies Advisor.
Total minimum number of credits required for a B.A. degree - $\mathbf{1 2 0}$.
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 120 , of which 45-65 are the core requirements and 33 are major requirements. For the International Studies major, the following courses at the introductory level are required, all 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 12 hours of advanced Foreign Language. 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 325, 329

Third World
Anthropology 270, 352, 353, and/or 392
Economics 224, 225, 226, and/or 228
History $363,365,367$, and/or 382
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 325, 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, and/or 229
International Politics:
History 328, 348, 364, and/or 376
Political Science 202, 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 College 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 Sociology and Anthropology Department.

## Recommended Course Sequence for

 International Studies Major
## Second Semester

## First Semester

Eng 101 Composition I
Hst 101 Worrd Civilization I Ec 101 Principles of Economics Ant 101 Intro. to Anthropology Foreign Language
PE 100 Activity

## Third Semester

Ant 270 Cultural Anthropology and/or
PS 202 International Relations and/or
Ec 229 Comparative
Economic Systems* Foreign Language* Core Requirements PE 100 Activity Eng 102 Composition II Hst 102 World Civilization II Ec 102 Principles of Economics II PS 105 Comparative Government Foreign Language* PE 100 Activity

## Fourth Semester

Ec 224 Economic Development and/or
Ec 225 International Trade and/or
Ec 226 International Investment and Finance*
Core Requirements
Major Electives
PE 100 Activity

Fifth Semester Sixth Semester
Study Abroad**
15

## Seventh Semester

| Foreign Language | 3 |
| :--- | ---: |
| Major Electives | 6 |
| Core Requirements | 6 |
|  |  |

oreign Language
Major Electives
Core Requirement Senior Seminar*

3
3
3
3
3
3
3
0

15

3

[^5] lional Sudies Advisor.

MATHEMATICS
Professor Sours, Chairman; Professor Emeritus Richards; Professors Merrill, Tillman, Wong; Associate Professors Berard, DeCosmo, Earl, Koch, Salsburg; Assistant Professors Anderson, Simmons; Instructor Kenney.

Total minimum number of credits required for a B.A. degree $\mathbf{- 1 2 5}$. Total minimum number of credits required for a B.S. degree -127 . Total minimum number of credits required for a minor -22 .
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 96), and a B.S. program in computer information systems (see page 93).

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.

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 chairman.

Minor in Mathematics
Required Courses:
Mth 111-112; 202; 211 or $212 ; 311$ or 331
Electives:
Any 300 -level course in mathematics
credit hours
19

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:
Mth 105-106 or Mth 111-112; CS 123; credit hours 20
Mth 351-352; and Mth 354
Electives:
One of the following: Mth/CS 262; CS 321;
or a Topics course in statistics
Total $\frac{3}{23}$

Required courses for a mathematics major are indicated in the following recommended curriculum outlines, which are based on an extensive prerequisite structure.

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 46-47, except that science electives must be in accordance with the Department's requirements specified on page 160 .

| First Semester |  | Second Semester |  |  |  |
| :--- | ---: | ---: | :--- | ---: | ---: | ---: |
|  | B.A. | B.S. |  | B.A. | B.S. |
| Mth 111 Calculus I | 4 | 4 | Mth 112 Calculus II | 4 | 4 |
| Eng 101 Composition I | 3 | 3 | Eng 102 Composition II | 3 | 3 |
| CS 123 FORTRAN | 3 | 3 | Core Requirements | 9 | 9 |
| Programming (or) |  |  | PE 100 Activity | 0 | 0 |
| CS 124 COBOL Programming |  |  |  | 16 | $\frac{16}{16}$ |
| Core Requirements | 6 | 6 |  |  |  |

Third Semester

|  | B.A. | B.S. |
| :--- | ---: | ---: |
| Mth 202 Set Theory <br> and Logic | 3 | 3 |
| Mth 211 Intro. to Linear | 4 | 4 |
| $\quad$ Algebra \& Differential |  |  |

## Fifth Semester

| Mth $331^{3}$ Intro. to Abstract Algebral | 4 | 4 |
| :---: | :---: | :---: |
| Mth 351 Probability and Mathematical Statistics I | 3 | 3 |
| Science Elective ${ }^{1}$ | 3 | 3 |
| Core Requirements | 6 | 6 |
|  | 16 | 16 |

## Seventh Semester

a Real Variable Mth/CS Elective Free Electives

$$
\begin{array}{rr}
3 & 3 \\
9 & 9 \\
\hline 16 & 16
\end{array}
$$

Fourth Semester
Mth 212 Multivariable B.A. B. H212 Calculus
Mth 214 Linear Algebra Science Elective ${ }^{1}$ Core Requirements PE 100 Activity

Sixth Semester
B.A. B.

Mth/CS Elective ${ }^{2}$ Free Electives

Eighth Semester
Mth/CS Elective B.A. B.. Free Electives

See page 160 for the Department's requirements regarding science elective
2 See page 160 tor the Departments requirements regarding science electives
3 Mith 311 and Mith 331 are offered in alternate years; one of them should be taken in the junior year, the otherinthe senior year.

## Recommended Course Sequence for

## Teacher Certification Mathematics Track

NOTE: All core requirements should be chosen to satisfy the General Core Requiremen listed on pages 46-47, except that science electives must be in accordance with the Department's requirements specified on page 160

First Semester

| Mth 111 Calculus I | 4 | 4 | Mth 112 Calculus II | B.A. | 4 |
| :--- | ---: | :--- | :--- | ---: | ---: |

Third Semester
Fourth Semester Calculus
Mth 214 Linear Algebra Ed 202 Educational Psychology Science Elective ${ }^{1}$ Core Requirements PE 100 Activity
1 B.A. B. 202 Set Theory

Ed 201 Intro. to Education
Phy 201 General Physics I
or Science Elective ${ }^{1}$
and Logic
101 Practicum
Education

Core Requirements
PE 100 Activity

33

$\begin{array}{ll}3 & 4 \\ 0 & 0\end{array}$
$\overline{16} \quad \overline{17}$

Fifth Semester

|  | B. A . | B.S. |
| :---: | :---: | :---: |
| Mth $331^{3}$ Intro. to Abstract Aloebra I | 4 | 4 |
| Mth 343 Intro. to Geometry | 3 | 3 |
| Science Elective ${ }^{1}$ | 3 | 3 |
| Core Requirements | 3 | 3 |

Seventh Semester

|  | B.A. | B.S. |
| :--- | ---: | ---: |
| Mth $311^{3}$ Functions of <br> a Real Variable | 4 | 4 |
| Mth 351 Probability and <br> Mathematical Statistics । | 3 | 3 |
| Mth/CS Elective |  |  |
| Free Electives | - | 3 |
|  | $\frac{7}{14}$ | $\frac{4}{14}$ |

Eighth Semester

| Ed 371 The Individual in | B.A. | B.S. |
| :--- | ---: | ---: |
| the Classroom |  |  |
| Ed 380 Professional |  |  |
| Semester in Education | 15 | 3 |
|  | $\overline{18}$ | $\overline{18}$ |

ISee page 160 tor the Department's requirements regarding science electives.
regarding Mith/CS electives
Mh 311 and Mith 331 are offered in alternate years; one of them should be taken in the junior year the other in the enior year

## Science Electives for Mathematics Majors:

B.A. candidates: Any three courses, including a two-semester sequence, in Biology, Chemistry, Earth and Environmental Sciences, o Physics.
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 or 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 or 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.

## Summary of Minimum Credit Distribution:

General and Applied Mathematics Tracks
Mth 111, 112, 202, 211, 212, 214, 311, 331, and 35
Mth/CS Electives
CS 123 or 124
Phy 201
Science Electives
Eng 101-102
Core Requirement
Free Electives

Teacher Certification Mathematics Track
Mth $111,112,202,203,212,214,31$
Mth/CS Elective
CS 123 or 124
Phy 201
Science Electives
Eng 101-102
Ed 101, 102, 201, 202, 371, and 380
Psy 101
Core Requirements
Free Electives
B.A. B.S.

| 35 | 35 |
| ---: | ---: |
| 3 | 9 |
| 3 | 3 |
| - | 4 |
| 9 | 7 |
| 6 | 6 |
| 26 | 26 |
| 3 | 3 |
| 30 | 30 |
| $\frac{10}{125}$ | $\frac{4}{127}$ |

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 quan tiative reasoning. Credits in this course will not be counted in the graduation requirement any degree program at Wilkes. Only P (passed) or F (failed) grades are given. Fee: $\$ 50$ 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 Basic quantitative and analytic techniques and concepts designed to help the student understan 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 error analysis, introduction to computing, vectors and matrices, and linear programming. No 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 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 relevan A study of the theory of arithmetic, structure of the number systems, and other topics relevan 10 the teaching of mathematics in ele
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

 bra, ations, and probability. Not open, to students with series, partial differentiation, differentil Prerequisite: Geometry, Algebra II and some knowledge of Trigon or 112 Offered every fall and summer.MTH 106. CALCULUS FOR LIFE, MANAGERIAL AND SOCIAL SCIENCES II

Four credits
A continuation of Mth 105. Not open
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 surentenwith credits in Mth 105 or 106
Prerequisite: 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
A continuation of Mth 111. Not open to students with credit in Mth 106.
Four credils Offered every fall, spring, and summer

MTH 150. ELEMENTARY STATISTICS
Three credits
Elementary statistical inference, with an emphasis on ideas, techniques, and applications inthe 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 Prematics majors or students with credit in Mth 351
rerequisite: Two years of high school algebra
Offered every fall and spring.

## MTH 202. SET THEORY AND LOGIC

Three 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 department chairman.
Offered every fall.

## MTH 203. THE TEACHING OF MATHEMATICS

 IN SECONDARY SCHOOLSThree credits
This course deals with topics and perspectives that are relevant to the teaching of mathemaicic in secondary schools ( $7-12$ ). Topics include: history of modern algebra and geometry as dedictive, axiomatic systems; recommendations of and material published by the various organiza-
tions (CUPM, SMSG, UICSM, etc.) concerned with the improvement of school mathematio curricula; local and national professional organizations, evaluation of instruction. (same as Ed 203G)
Prerequisite: Junior standing in mathematics
Offered on demand.

MTH 211. INTRODUCTION TO LINEAR ALGEBRA AND
DIFFERENTIAL EQUATIONS
Four credits
Topics include: Matrices; determinants; vector spaces; linear transformations; eigenvalues and Topics include: Matrices, determinants, vector spaces, inear transformations; eigen
Prereauisite: Mth 112
Offered every fall and summer.
VTH 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 partial dife inicentals, inverse functions, theorems of Green and Stokes.
Prerequisite: Mth 112
Offered every spring and summer.
MTH 214. LINEAR ALGEBRA
Three credits
Vector spaces, linear transformations, matrices, determinants, bilinear and quadratic forms, natrix polynomials.
Prerequisite: Mth 112 or consent of instructor
Offered every spring.
ITH 232. ABSTRACT ALGEBRA FOR ELEMENTARY SCHOOL TEACHERS

Three credits
study of basic concers of are the creat ematics 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.

## ITH 243. GEOMETRY FOR ELEMENTARY

SCHOOL TEACHERS
Three credits A study of topics in informal geometry and measurements for elementary school teachers. Not pen 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)
Prerequisite: Mth 106, CS 123.
Offered in the fall semester of odd years.
MTH 262. OPERATIONS RESEARCH
A survey of operations research topics such as decision analysis, inventory models, queueing nodels, dynamic programming, network models, heuristic models, and non-linear programning. (same as CS 262)
Prerequisite: CS 123; Mth 105-106 or Mth 111-112; and some elementary knowledge of matrices.
Offered every spring.
MTH 311. FUNCTIONS OF A REAL VARIABLE 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 credit

 Complex functions, limit, continuity, analytic functions, power series, contour integration Laurent expansion, singularities and residuesPrerequisite: Mth 212 or consent of instructor
Offered in the fall semester of even years.
MTH 331. INTRODUCTION TO ABSTRACT ALGEBRA I
A 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 credit
Metric spaces, topological spaces, countability and separation axioms, compactness, connect edness, 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, hypothesis testing, non-parametric methods, multivariate distributions, introduction to vals, hypothesis
linear models.
Prerequisite: Mth 106 or 112 or permission of instructor
Offered every fall.
MTH 352. PROBABILITY AND MATHEMATICAL STATISTICS II

Three credits A continuation of Mth 351
Prerequisite: Mth 351 or permission 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 regres ion; analysis of variance and covariance; design of experiments; contingency tables; and mul ivariate techniques, including factor analysis.
Prerequisite: Mth 150 or Mth 351 or consent of instructor.
Offered in the spring semester of even years.

## MTH 361. INTRODUCTION TO APPLIED

 MATHEMATICS IIntended 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 continuation of Mth 361
continuation of Mth 36
Offered every spring
MTH 364. NUMERICAL ANALYSIS
Three credits
Sumerical methods of differentiation, integration, solution of equations and of differentia Numerical methods or with emphasis on problems that lend themselves to solution using computers. (same ${ }_{5}$ CS 364
Prerequisite: Mth 211 and CS 123 or consent of instructo
Offered in the spring semester of odd years.
MTH 397. SEMINAR
One to three credits
Presentations and discussions of selected topics.
Prerequisite: Approval of department chairman.
MTH 413. FUNCTIONS OF SEVERAL VARIABLES Three credit 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.
Prerequisite: Mth 214 and 311
Offered when demand warrant
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
Individual study of special topics under the supervision of a faculty member. Designed for stu dent who have completed a substantial amount of course work in mathematics. May be re peated for credit.
Prerequisite: Senior standing and consent of department chairman.
MTH 198/298/398/498. TOPICS IN MATHEMATICS in the upper-level courses in analysis, topology, algebra, and probability. May be repeated for credit.
Prerequisite: Varies with topics studied,
Adational 500 -levee graduate courses in mahematics are open to quainied mathematics majors. Se the graduate bulletin for complete listing.

## MEDICAL TECHNOLOGY

Total minimum number of credits required for a B.S. degree -128 .
The National Accrediting Agency for Clinical Laboratory Science recon mends certain requirements for a program of training leading to a B.S. d gree. The curriculum offered at Wilkes College follows these recommend tions and is presented below

At the completion of three years, the student may be accepted by an affil ated program of medical technology for a period of twelve months' clinica training. Following graduation from the program, the student will receis training. Following graduation from the program, the student will receiv
the B.S. degree in medical technology from the College and will be eligibl for certification as a medical technologist by the Board of Registry of Med cal Technology or as a Clinical Laboratory Scientist by the National Certifcation Agency for Medical Laboratory Personnel.
Wilkes College has established a formal affiliation with the Allentow 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 non-affiliated hospitals requires special permission of the department chair man and of the Academic Standards Committee

## Recommended Course Sequence for a Degree in Medical Technology

## First Semester

Bio 121 Principles of Modern Biology I 4 Chm 115 Elements and Compounds Eng 101 Composition Mth 105 or 111 Calculus PE 100 Activity

Third Semeste
Bio 223 Comparative Anatomy II
Chm 231 Organic Chemistry I Humanities Core Requirements Social Science Core Requirements PE 100 Activity

Second Semester
Bio 122 Principles of Modern Biologyll Chm 116 The Chemical Reaction Eng 102 Composition II Mth 106 or 112 Calculus II PE 100 Activity

## Fourth Semester

Bio 224 Cellular and Molecular Biology Chm 232 Organic Chemistry II Humanities Core Requirements Social Science Core Requirements PE 100 Activity

## Fifth Semester

Bio303 Bacteriology
Bio 397 Seminar*
Chm 241 Inorganic Quantitative
Analysis
Computer Science Elective
Phy 105 Introductory Physics Social Science or
Mumaities Core Requirements

## Sixth Semester

 Bio 313 Parasitology Bio 341 Immunology and Immunochemistry Bio 397 Seminar* Mth 150 Elementary Statistics Phy 106 Introductory Physics II Social Science orHumanities Core Requirements 6-17

Seventh Semester
Eighth Semester
MEDICAL TECHNOLOGY PROFESSIONAL STUDY YEAR
The 30 credits supplied by the twelve months' clinical rraining are divided into the following courses:

Bio 398 0-MT Clinical Microbiology Bio 398 P-MT Clinical Chemistry Bio 398 Q-MT Clinical Hematology/Coagulation Bio 398 R-MT Clinical Immunohematology Bio 398 S-MT Clinical Immunology/Serology Bio 398 T-MT Clinical Seminar

$$
\begin{array}{r}
7 \\
8 \\
5 \\
4 \\
3 \\
3 \\
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\end{array}
$$

'Only one semester of Bio 397 is required but it must be taken in either the fith or sixth semester


## MUSIC

Assistant Professor Campbell, Chairman; Professors Emeritii Chapline, A. Liva; Associale Professors Garber, Santos; Assistant Professors Newson, Reiprich; Adjunct Professors Hannigan, Harrington, Heinze, Hrynkiw, Metzger, Nowak, Rinert, Sanderson, Teubner.
Total minimum number of credits required for a B.M. degree number varies with program

## Purposes

The Music Program at Wilkes College leads to a Bachelor of Music degree with a major in either applied performance studies or certification in music education (K-12).

The purposes of the degree offering are to:

1. Give students a comprehensive exposure to all aspects of musical training relevant to their degree specialization;
2. Provide for contemporary careers which meet the needs of today's student in today's world;
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 aptitudes and achievements and their general academic background are qualified to pursue work at Wilkes College.
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 competencybased 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, anaytical 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 Bachelor of Music - Applied Voice

Degree completed with 127 semester credits.

First Semester
Mus 000 Recital Attendance Mus 010 Functional Piano* Mus 100 Applied Performance Mus 103 Comp. Musicianship I Mus 105 Harmonic Foundations I Mus 107 Analysis of Music I Mus 121 or 131 Ensemble (Minor)** Mus 125 Ensemble (Major)
Eng 101 Composition
Foreign Language***
PE 100 Activity
-Compelency must be passed
"Einer one may be chosen
...Futills one component of humanities core requirement.

## Third Semester

## Mus 000 Recital Attendance

 Mus 121 or 131 Ensemble (Minor)* Mus 125 Ensemble (Major) Mus 200 Applied Performance Lhus Applied Performance Mus 203 Comp. Musicianship III Mus 205 Harmonic Foundations II Mus 207 Analysis of Music III Mus 258 Vocal Methods Foreign Language**PE 100 Activity

Second Semester 0 Mus 000 Recital Attendance $0 \quad$ Mus 010 Functional Piano* 2 Mus 100 Applied Performance Mus 104 Comp. Musicianship II Mus 106 Harmonic Foundations II Mus 108 Analysis of Music II Mus 121 or 131 Ensemble (Minor)** Mus 125 Ensemble (Major) Eng 102 Composition Foreign Language*** PE 100 Activity

0
$\overline{18}$
'Eiter may be chosen.
'EEither may be chosen.

## Fifth Semester

 Mus 000 Recital Attendance Mus 125 Ensemble Mus 128 Chamber Performance* Mus 260 Conducting I Mus 300 Applied Performance Mus 300 Applied Performance Mus 305 Composition/OrchMus 307 Pedagogy (Vocal) Psy 101 General Psycholog Core Requirements

## Fourth Semeste

 Mus 000 Recital Attendance Mus 000 Recital Attendance0 0 Mus 125 Ensemble (Major) 2 Mus 200 Applied Performance 2 Mus 204 Comp. Musicianship IV 3 Mus 206 Harmonic Foundations IV 3 Mus 208 Analysis of Music IV
2 Mus 259 Diction Foreign Language* PE 100 Activity

## Sixth Semester

us 000 Recital Attendance Mus 125 Ensemble
0 Mus 125 Ensemble
1 Mus 128 Chamber Performance*
2 Mus 261 Conducting II
2 Mus 300 Applied Performance Mus 300 Applied
Mus 301 Recital
Mus 306 20th Century Theory Mus 306 20th Century
Core Requirements Core Requirements
$\frac{-}{16}$

Seventh Semester
Mus 000 Recital Attendance Mus 125 Ensemble
Mus 128 Chamber Performance* Mus 400 Applied Performance Mus 407 Music Literature (Voice)
Free Electives
Core Requirements

## Eighth Semester

## Mus 000 Recital Attendance

 Mus 125 EnsembleMus 400 Applied Performance Mus 401 Recital
Mus 410 Chamber Literature
Free Electives
Core Requirements

Public performance required

## Recommended Course Sequence for

 Bachelor of Music - All Applied InstrumentsExcept Voice and Keyboard
Degree completed with 127 semester credits.

## First Semester

Mus 000 Recitai Attendance Mus 010 Functional Piano Mus 100 Applied Performance Mus 103 Applied Performance Mus 103 Comp. Musicianship I Mus 105 Harmonic Foundation Mus 107 Analysis of Music I Mus 121 or 131 Ensemble (Major) Mus 125 Ensemble (Minor) Eng 101 Composition Core Requiremen

Second Semester
0 Mus 000 Recital Attendance 0 Mus 000 Recital Attendance 2 Mus 100 Applied Performance 2 Mus 104 Comp. Musicianship II 3 Mus 106 Harmonic Foundations II Mus 108 Analysis of Music II Mus 108 Analysis of Music II
Mus 121 or 131 Ensemble (Major) Mus 121 or 131 Ensemble (Ma
Mus 125 Ensemble (Minor) Mus 125 Ensemble (Min Eng 102 Composition
Core Requirements PE 100 Activity

Mus 131, if applied string or music education major (string concentration)

## Third Semester

Mus 000 Recital Attendance Mus 121 or 131 Ensemble (Major)* Mus 125 Ensemble (Minor) Mus 200 Applied Performance Mus 203 Comp. Musicianship III Mus 205 Harmonic Foundations III Mus 207 Analysis of Music III Mus 260 Conducting I Psy 101 General Psychology PE 100 Activity

## Fourth Semester

 us 000 Recital Attendance Mus 121 or 131 Ensemble (Major) Mus 125 Ensemble (Minor) Mus 200 Applied Performance Mus 204 Comp. Musicianship IV Mus 206 Harmonic Foundations IV Mus 208 Analysis of Music IV Mus 261 or 262 Conducting Core Requirements PE 100 ActivityFifth Semester
Mus 000 Recital Attendance Mus 121 or 131 Ensemble* Mus 128 Chamber Performance** Mus 22 a 264 Conducting Ill Mus 2000 Aplied Performa Mus 300 Applied Performance Mus 305 Composition/Orchestration Mus 311-315 Pedagogy Core Requirements

## Sixth Semester

Mus 000 Recital Attendance
Mus 121 or 131 Ensemble* Mus 128 Chamber Performance** Mus 300 Applied Performance Mus 301 Recital
Mus 306 20th Century Theory Mus 411 Music Literature (Orchestra) Core Requirements

Mus 131 i it applied string ormusi ed 2 ion (string concentration)
."Public pertormance required

## Seventh Semester

Mus 000 Recital Attendance Mus 121 or 131 Ensemble* Mus 128 Chamber Performance** Mus 400 Applied Performance Mus 407-415 Music Lit. (major idiom)
Free Electives*** Core Requirements

Eighth Semester

## 0 Mus 000 Recital Attendance

Mus 000 Recital Attendance Mus 121 or 131 Ensemble* Mus 400 Applied Performance Mus 401 Recital
Mus 407-415 Music Literature (Chamber Literature)
Free Electives***
Core Requirements

## 6 -15

Mus 131, iapplied string or music educaion major (string concentration)
"Public pertormance required.
.Six elective credits must be non.music.

## Recommended Course Sequence for

 Bachelor of Music - Applied Keyboard
## Degree completed with 127 semester credits.

First Semester
Mus 000 Recital Attendance Mus 100 Applied Performanc Mus 103 Comp. Musicianship I Mus 105 Harmonic Foundations I Mus 107 Analysis of Music I Mus 121 or 131 Ensemble (Mino Mus 121 or Ensemble (Major) Mus 125 Ensembie (MM Eng 101 Composition Core Requiremen PE 100 Activity
Eine nemay be chosen

## Second Semester

## 0 Mus 000 Recital Attendance

2 Mus 000 Recital Attendance
2 Mus 100 Applied Performance
Mus 104 Comp. Musicianship II
Mus 106 Harmonic Foundations II Mus 108 Analysis of Music II Mus 108 Analysis of Music II Mus 121 or 131 Ensemble (Min Mus 125 Ensemble (M
Eng 102 Compositio
Core Requiremen

## Third Semester

Mus 000 Recital Attendance Mus 121 or 131 Ensemble (Minor)* Mus 125 Ensemble (Major)
Mus 200 Applied Performance
Mus 203 Comp. Musicianship III Mus 205 Harmonic Foundations III Mus 207 Analysis of Music III Mus 212 Keyboard Accompanying Psy 101 General Psychology PE 100 Activity

## Fourth Semester

 Mus 000 Recital Attendance Mus 121 or 131 Ensemble (Minor) Mus 125 Ensemble (Major)Mus 200 Applied Performance
Mus 204 Comp. Musicianship IV
Mus 206 Harmonic Foundations IV
Mus 208 Analysis of Music IV
Mus 213 Accompanying Practicum Core Requirements
PE 100 Activity

Either one may be chosen.

## Fifth Semester

Mus 000 Recital Attendance
Mus 125 Ensemble
Mus 128 Chamber Performance* Mus 214 Accompanying Practicum Mus 260 Conducting
Mus 300 Applied Performance
Mus 305 Composition \& Orchestration Mus 309 Pedagogy (Piano)
Core Requirements

## Seventh Semester

## Mus 000 Recital Attendance

Mus 125 Ensemble
Mus 128 Chamber Performance Mus 400 Applied Performance Mus 409 Keyboard Literature Core Requirements
Free Electives**

[^6]-Six elective credits must be non-music

Sixth Semester Mus 000 Recital Attendance Mus 125 Ensemble
Mus 128 Chamber Performance* Mus 215 Accompanying Practicum Mus 261 or 262 Conducting II Mus 300 Applied Performance Mus 301 Recital
Mus 30620 th Century Theory Core Requirements

## Eighth Semester

Mus 000 Recital Attendance
Mus 125 Ensemble
Mus 400 Applied Performance Mus 401 Recital
Mus 410 Chamber Literature Core Requirements Free Electives**

## Recommended Course Sequence for Bachelor of Music - Music Education

## Vocal Track (with certification)

Degree completed with 138 semester credits.

## First Semester

Mus 000 Recital Attendance
Mus 010 Functional Piano
lus 010 Functional Piano
Ilus 100 Applied Performance (Major) Ius 103 Comp. Musicianship I Hus 105 Harmonic Foundatio Mus 107 Analysis of Music I Mus 121 or 131 Ensemble (Minor)* Mus 125 Ensemble (Major)
Eng 101 Composition
Core Requirement
PE 100 Activity
'Eitere one may be chose

Third Semester
Mus 000 Recital Attendance
Mus 000 Recital Attendanc Mus 011 Functional Guitar* hus 121 or 131 Ensemble (Minor)** Mus 125 Ensemble (Major) Mus 200 Applied Performance (Major) Mus 200 Applied Performance (Minor) Mus 203 Comp. Musicianship III Mus 205 Harmonic Foundations II Mus 207 Analysis of Music III Mus 258 Vocal Methods Mus 260 Conducting I Psy 101 General Psychology PE 100 Activity

## Second Semester

 Mus 000 Recital Attendance Mus 100 Applied Performance (Major) Mus 104 Comp. Musicianship II , 100 Ham. 108 A s 108 Analysis of Music Mus 121 or 131 Ensemble (Minor) Mus 125 Ensemble (Major)Eng 102 Compositio
Pore Requiremen
3
PE 100 Activity

## Fourth Semeste

## Mus 000 Recital Attendance

Mus 011 Functional Guitar* Mus 121 or 131 Ensemble (Minor)** Mus 125 Ensemble (Major) Mus 200 Applied Performance (Major) Mus 200 Applied Performance (Minor) Mus 204 Comp. Musicianship IV Mus 206 Harmen Musicianship IV Mus 208 Analysis of Music IV Mus 259 Voice Diction
Core Requirements PE 100 Activity
$-\frac{0}{17}$
"Eitier one may be chosen.

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| Fifth Semester |  | Sixth Semester |
| :---: | :---: | :---: |
| Mus 000 Recital Attendance | 0 | Mus 000 Recital Attendance |
| Mus 125 Ensemble (Major) | 0 | Mus 125 Ensemble (Major) |
| Mus 250 Teaching of Elementary Music | 2 | Mus 252 Teaching of General Music |
| Mus 254-257 Instrumental Methods* | 2 | Mus 263 Adv. Choral Conducting III |
| Mus 261 Conducting II | 2 | Mus 300 Applied Performance (Major) |
| Mus 300 Applied Performance (Major) | 1 | Mus 300 Applied Performance (Minor) |
| Mus 300 Applied Performance (Minor) | 1 | Ed 102 Practicum in Education |
| Ed 101 Practicum in Education | 1 | Ed 202 Educational Psychology |
| Ed 201 Introduction to Education | 3 | Core Requirements |
| Core Requirements | 6 |  |
|  | 18 |  |
| *Student elects two of four instrumental methods courses. |  |  |
| Seventh Semester |  | Eighth Semester |
| Mus 000 Recital Attendance | 0 | Mus 000 Recital Attendance |
| Mus 125 Ensemble (Major) | 0 | Mus 125 Ensemble (Major) |
| Mus 351 Teaching of Sec. Choral Music** | 2 | Mus 254-257 Instrumental Methods* |
| Mus 352 Teaching of Sec. Instr. Music | 2 | Mus 400 Applied Performance (Major) |
| Mus 400 Applied Performance (Major) | 2 | Mus 401 Recital |
| Ed 382 Intern Teaching | 11 | Ed 381 Professional Practicum*** Core Requirements |
|  | 17 |  |

**Accelerated courses

*     *         * Credited from seventh semester.

Recommended Course Sequence for Bachelor of Music - Music Education Instrumental Track (with certification)

Degree completed with 138 semester credits.

| First Semester |  | Second Semester |  |
| :---: | :---: | :---: | :---: |
| Mus 000 Recital Attendance | 0 | Mus 000 Recital Attendance |  |
| Mus 010 Functional Piano | 0 | Mus 010 Functional Piano |  |
| Mus 100 Applied Performance (Major) | 2 | Mus 100 Applied Performance (Major) |  |
| Mus 103 Comp. Musicianship I | 2 | Mus 104 Comp. Musicianship II |  |
| Mus 105 Harmonic Foundations I | 3 | Mus 106 Harmonic Foundations II |  |
| Mus 107 Analysis of Music I | 3 | Mus 108 Analysis of Music |  |
| Mus 121 or 131 Ensemble (Major)* | 0 | Mus 121 or 131 Ensemble (Major)* |  |
| Mus 125 Ensemble (Minor) | 0 | Mus 125 Ensemble (Minor) |  |
| Eng 101 Composition | 3 | Eng 102 Composition |  |
| Core Requirements | 3 | Core Requirements |  |
| PE 100 Activity | 0 | PE 100 Activity |  |
|  | 16 |  |  |

The College of Arts and Sciences

| 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 | PE 100 Activity | 0 |
| PE 100 Activity | 0 |  |  |
|  | 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.
Core electives must include $\mathbf{1 8}$ credits in humanities, including English 101 and 102; 6 in mathematics/sciences; 12 in social sciences, including Psychology 101.

The College of Arts and Sciences

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 pen to all members of the College community, by audition. The ensemble rehearses and resents 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. Coaching and supervision by faculty members, as assigned Coaching and supervision by faculty members, as assigned.
Prerequisite: 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.
Prerequisite: 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
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, able materials for classroom use, arranging ander playing, folk dancing, composition of suitable materials for classroom use, arranging and adapting existing music for the Orff instrumen-
tarium. 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 sti-
dents to learn the techniques of group performan dents to learn the techniques of group performance in the principal instrumental and vocal ar: eas. 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 tudents

MUS 254. Woodwinds Methods
MUS 255. Brass Methods
MUS 256. String Methods
MUS 257. Percussion Methods
MUS 258. Vocal Methods
Prerequisite: Mus 100, 103-106, sophomore standing, or consent of instructor
MUS 259. VOICE DICTION
Two credit
An intensive study of the phonics of English, French, German, and Italian languages, bas upon the International Phonetic Alphabet. Practical application is achieved through song liten ure selected from all historical periods. Required of all voice performance and choral musi education majors

## MUS 260-264. CONDUCTING I-III

Two credit
Through class lectures, demonstrations and laboratory performances, students learn and pra tice the fundamental techniques of conducting. Score reading and preparation, basic condue. ing patterns, gestures, and rehearsal methodology will be studied. The emphasis will be actual laboratory experience.

MUS 260. Introduction to Conducting
MUS 261. Choral Conducting II
MUS 263. Advanced Choral Conducting II
MUS 264. Advanced Instrumental Col
Prerequisite: Mus 103-108, sophomore standing, or consent of instructo
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 i all combinations, including orchestral, wind, jazz, and chamber ensembles
Prerequisite: Mus 206 and 208.

MUS 306. 20th CENTURY THEORY
A survey of twentieth-century theoretical systems emerging from post-romantic and impres sionistic 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.
Prerequisite: 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:

$$
\begin{array}{ll}
\text { MUS 307. } & \text { Voice Pedagogy } \\
\text { MUS 309. } & \text { Piano Pedagogy } \\
\text { MUS 311. } & \text { Woodwind Pedagogy } \\
\text { MUS 313. } & \text { Brass Pedagogy } \\
\text { MUS 315. } & \text { String Pedagogy }
\end{array}
$$

MUS 315. String Pedagogy
Prerequisite: Mus 200, junior standing, or consent of instructor.
MUS 351. TEACHING OF SECONDARY CHORAL MUSIC
An examination of the administration and logistics of a secondary choral music program. A stematic development of teaching and rehearsal techniques, planning, and evaluation. systematic development of teaching and rehearsal techniques, planning, and evaluation
Prerequisite: Mus $250,252,260$ and 261 , junior standing, or consent of instructor.

MUS 352. TEACHING OF SECONDARY
INSTRUMENTAL MUSIC
Two credits mexamination of the administration and logistics of a secondary instrumental music program. Asystematic development of teaching and rehearsal techniques, planning, and evaluation Prerequisite: 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 chairman
MUS 397. SEMINAR
Presentation and discussion of selected topics.
Prerequisite: Approval of department chairman

## 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 409. Keyboard Literatur
MUS 410. Chamber Literature
MUS 411. Orchestral Literature
MUS 412. Woodwind Literature
MUS 413. Brass Literature
MUS 414. String Literature
MUS 415. Percussion Literature
Prerequisite: Mus 205-208, senior standing in music, or consent of instructor.

## NURSING

Associate Professor Kolanowski, Chairperson; Associate Professors Druffner, Grabo, Telban Assistant Professors Anselmi, Baker, Crowley, Gunderman, Kaminski, Merrigan, Notarianni, Russin, Saueraker, Schreiber, Sheer, Sherman, Steelman, Wolak, Zack; Adjunt Por Babcock.

Total minimum number of credits required for a B.S. degree -129

## 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 in terview with the department chairman 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.
A student may be required to submit, at any time, to a health evaluation by the College physician, or nurse practitioner, if evident limitations interfere with the student's practice or learning

In addition to fulfilling the academic requirements of the College, 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 Degree in Nursing

## First Semester <br> Bio 115 Human Anatomy and <br> Second Semester

 Physiology IChm 111 Intro. to Chemical Reactions and Principles
Eng 101 Composition I
Psy 101 General Psychology
Soc 101 Intro. to Sociology or
Ant 101 Intro to Anthropology PE 100 Activity

## Third Semester

Bio 113 Microbiology
Nsg 200 Nutrition
Nsg 201 Introduction to Nursing
Core Requirements or Mth 150
PE 100 Activity
4
3 PE 100 Activity

## Fifth Semeste

Nsg 203 Nursing Care of 8
the Adult Client
Core Requirements
Free Electives

## Seventh Semester

Nsg 301 Nursing Care of
8
the Older Client
Nsg 303 Contemporary Issues in
Nursing or Free Electives
Nsg 305 Research in Nursing
Core Requirements

Sixth Semester
Nsg 204 Nursing Care of the Adult Client II Core Requirements Free Electives

## Eighth Semester

Nsg 302 Senior Practicum Nsg 303 Contemporary Issues in Nursing or Free Electives Core Requirements Free Electives

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, healh 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 hourd Prerequisite: Bio 116, Chm 130, Psy 102, Soc 275, Mth competency.
Corequisite: Nsg 200, Bio 113.
NSG 202. NURSING CARE OF THE YOUNG CLIENT
Basic concepts introduced in Nsg 201 are utilized in assisting young families 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: $\$ 75$.
Prerequisite: 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 adults and their families to maintain optimum well ness and to resolve selected health problems. Nursing theory as related to the bio-psychosocial aspects of adult care is correlated with clinical practice in adult 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 The nursing process is utilized in the care of the adult family member with increasingly com plex bio-psychosocial problems. Acute care is viewed through related clinical experiences in medical, surgical, and psychiatric settings. Relevant findings from nursing research are incor porated. Hours weekly: 4 hours class, 12 hours clinical practice. Fee: $\$ 75$
Prerequisite: Nsg 203.
NSG 270. RECENT TRENDS IN CLINICAL NUTRITION 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 understand and communicate in terminology common to the health care professions. The em phasis will be on understanding the language in context rather than memorization of unrelated terms.

NSG 272. CLINICAL APPLICATION OF PHARMACOLOGY and environmental factors
Prerequisite: Junior and Senior Nursing students and Registered Nurses.

NSG 299. NURSING FORUM I
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 ership 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 bio-psychosocial aspects of client health is correlated with clinical practice in a variety of health care settings. Prerequisite: RN status or NCLEX eligibility.

NSG 301. NURSING CARE OF THE OLDER CLIENT
Eight credits
The nursing process is utilized in the care of the older adult family member. Content reflect the The nursing process is utilized in the care of the older adult family member. Content reflects the
major changes accompanying the aging process, as well as the interactive effects of multiple pathological conditions. 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 leaderExplores current nursing theories and models of practice, and develops the concepts of leaderprevious 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: $\$ 75$. Prerequisite: Nsg 301 and Nsg 305.

NSG 303. CONTEMPORARY ISSUES IN NURSING
Three credits Explores current issues and trends in nursing and health care within a seminar format. Hours weekly: 3 hours class.
Prerequisite: Nsg 204

## NSG 305. INTRODUCTION TO 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.
Prerequisite: 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 sys. em . 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.
Prerequisite: 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. Prerequisite: 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 198/298/398. TOPICS IN NURSING
Variable credit
A study in topics of special interest that are not exclusively treated in regularly offered courses.

## OCCUPATIONAL THERAPY

See Health Sciences Programs, page 145.

## PHILOSOPHY

Associate Professor Henson, Chairman; Professor Kay.
Total minimum number of credits required for a B.A. degree $\mathbf{- 1 2 1}$ 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 chairman. 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 Degree in Philosophy

## First Semester

Eng 101 Composition I Core Requirements PE 100 Activity

Third Semester
Phl 101 Introduction to Philosophy Core Requirements
Free Electives
PE 100 Activity

## Second Semester

Eng 102 Composition I
Core Requirements
PE 100 Activity

Fourth Semester
Phl 152 Introduction to Logic Core Requirements Free Electives PE 100 Activity

3
12
12
0 $\frac{0}{15}$

3
3
6
PE 100 Activity 6

Fifth Semester
Major Electives Free Electives
$\frac{9}{15}$

Major Electives
Free Electives

Eighth Semeste Major Electives Free Electives

Sixth Semester

PHL 101. INTRODUCTION TO PHILOSOPHY
Three credits An introduction to the major figures, problems, an thought. Students in this course typically examine a variety of philosophical puilososphical 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 credis
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 word 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 credils
Renaissance to the luding the writing thought from the Renaissance to the end of the eighteenth century, in 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 nine teenth century, including the works of Fichte, Schopenhauer, Mill, Kierkegaard, Nietzscle, 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 emphasi 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 Amer can thought, such as realism, idealism, and pragmatism, as well acine major figurs Prerequisite: Phl 101 or 201

PHL 210. ETHICS
A study of the values, ideals, and ideologies which comprise the foundations of human con tuct. Several major ethical theories will be examined, e. g., egoism, altruism, and utilitarian ism, along with a number of ethical problems such as moral skepticism, relativism, the concept ism, 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
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, photogra phy, moion picturs, least one major theory of art, such llingwood.
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 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
An examination of the form and content of the books of the New Testament as literary product 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" heologies. The impact of scientism, linguistic philosophies, and ecumenism on modern theol gizing; the thinkers whose views will be considered include Barth, Brunner, the Niebuhrs, Bultmann, Farmer, Weiman, Maritain, Buber, Sartre, Heidegger, Tillich, Rahner, Rubenstein, Alizer, Cox, Brown, and Weigel
Prerequisite: Phl 101 or 201

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The College of Arts and Sciences
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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 censor-
ship, 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 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 Phi 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, Aristoextensions of these theories in contemporary ethical thinking. The role which such imporamt 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 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 atheisic, 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, arcel, 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 chairman is required.

PHL 397. SEMINAR
One to three credits Presentations and discussions of selected topics. Prerequisite: Approval of department chairman is required.


PHYSICAL EDUCATION AND HEALTH
Assistant Professor Wingert, Chairman; Professor Reese; Associate Professors Saracino, Schmidt; Assistant Professor Meyers; Coaches Kest, Rainey, Unsworth; Trainer, Aed.

Physical education is an integrated part of the total educational program at Wilkes College. 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 needs, interests, and physical fitness goals.

Students are required to complete four semesters of Physical Education, each semester being a different learning experience. It is recommended that students fulfill their four semesters of Physical Education in the first two years of their program. The only exceptions to this requirement are madeto veterans of the military service and to students who have medical excuses which are submitted to and verified by the College 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
re developed. This course provides instrat niques of free weights.

PE 120. BEGINNING BOWLING 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 Designed for students who have developed fundamental bowling skills and now pep style of delivery, methods of aiming, rules, and team concepts.

PE 125. BEGINNING BADMINTON
This course provides instruction in the fundamental skills of badminton with emphasis credir rules, and strategy.

PE 126. ADVANCED BADMINTON Designed for students who have developed should be able to apply the rules and basic strategy to tournament competition. Prerequisite: PE 125 or approval of instructor.

The College of Arts and Sciences
Page 191

PE 130. AEROBIC DANCE ments of fitness 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
This course presents No credit rrvation of cultural her PE 135. AEROBIC FITNESS Group program for students to achieve aerobic fitness.

PE 136. FITNESS ACTIVITIES - JOGGING This course is designed to develop a self-styled jogging program. Emphasis on warm-up, individual jogging, and cool-down.

PE 140. BEGINNING GOLF
Anappreciation of golf as liferimedit An appreciation of golf as a lietime activity is stressed. Instruction or wing mechanics, rules, erminology, and safety practices taught. Weather permitting, outdoor practice of skills will be 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 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 cerififcation 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 couse.

PE 175. TENNIS INSTRUCTION No credil
Designed to teach fundamental skills, terminology, mechanics of offensive and defensive movements, strategy, and rules of play.

PE 180. BEGINNING VOLLEYBALL No credir
This course teaches the basic skills of volleyball. Serves, sets, bump passes, spikes, and rules of play are emphasized

PE 181. ADVANCED VOLLEYBALL No credir
This course is designed for students who have developed fundamental skills for power volley. ball. 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 partof the college curriculum
PE 210. CONTEMPORARY HEALTH PROBLEMS Two credis A study of present-day health problems. The course undertakes to help students enjoy maximum health and happiness through a better understanding of themselves, their relationships with other people, and their functioning 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. Two hours each week.

PE 310. TREATING ATHLETIC INJURIES
Three credilis
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.

## PE 315. EMERGENCY CARE TECHNIQUES

Three credits
A course designed to provide experiences (both practical and theoretical) in the application of A course designed to provide experiences (both practical and theoretical) in the application of enable the student to render such care.
Prerequisite: student must possess a current Cardiopulmonary Resuscitation (CPR) Card.

## PE 298/398. TOPICS IN HEALTH AND/OR

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.

## PHYSICAL THERAPY

See Health Sciences Programs, page 145.

## PHYSICS

Professor Bellas, Chairman; Professor Emeritus Donahoe; Professors Hostler, Orehotsky; As scoiate Professor Emeritus Bailey; Associate Professors Maxwell, Placek; Assistant Professors Kucirka, Loncoski.

Total minimum number of credits required for a B.S. degree - $\mathbf{1 3 1}$. Total minimum number of credits required for a B.A. degree $\mathbf{- 1 2 7}$. Total minimum number of credits required for a B.S. degree in Medical \& Health Physics - 132.

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 Healh 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

 Mth 111 Calculus Ior 105 Intro. to Calculus I
Core Requirements
PE 100 Activity

Third Semester
Chm 115 Elements \& Compounds
Mth 211 Differential Equations
or Science Elective
Phy 201 General Physics I
Core Requirements
PE 100 Activity

## Fifth Semester

Phy 203 General Physics III
Phy 221 Elect. Instrumentation
Core Requirements
Free Electives*

Seventh Semester
Phy 391 Senior Projects I
Core Requirement
Free Electives*

## Sixth Semester

Computer Science Elective Statistics Elective Core Requirements Free Electives*

## Fourth Semester

Chm 116 Chemical Reaction Mth 212 Multivariable Calculus or Science Elective hy 202 General Physics II Core Requirement PE 100 Activity

## Eighth Semester

 Phy 392 Senior Projects II Free Electives*
## Second Semester

Eng 102 Composition II Mth 112 Calculus II
or 106 Intro. to Calculus II PE 100 Activity
9.10
$\frac{1}{16.17}$

| First Semester |  |
| :--- | ---: |
| Eng 101 Composition I | 3 |
| Uht 111 Calculus I | 4 |
| Phy 201 General Physics I | 4 |
| Core Requirements | 6 |
| PE 100 Activily | 0 |
|  | $\overline{17}$ |

Third Semester Chm 115 Elements \& Compounds Wh 211 Differential Equations Phy 211 Statics \& Dynamics Phy 221 Elect. Instrumentation Core Requirements
Core Requirementer
PE 100 Activity

Phy 301 Math. in Phys. \& Sciences Phy 330 Optics
Phy 331 E \& MI
Phy 333 E \& M Lab।
Core Requirements

Seventh Semester
phy 351 Quantum Mechanics Ply 391 Senior Projects I Science Elective(s) 4-6 Core Requirements

Second Semester
Eng 102 Composition II Mth 112 Calculus II Phy 202 General Physics II Computer Science Elective Core Requirements
PE 100 Activity

## Fourth Semester

Chm 116 Chemical Reaction
Mth 212 Multivariable Calculus Phy 203 General Physics III Phy 340 Thermodynamics Phy 340 Thermodynami or 310 Mechanic PE 100 Activity
PE 100 Activity

## Sixth Semester

Phy 302 Math. in Phys. \& Sciences 3 Phy 310 Mechanics
or 340 Thermodynamics
Phy 332 E \& M II
Phy 334 E \& M Lab II
Phy 380 Nuclear Physics
or 361 Atomic Physics
Phy 382 Nuclear Physics Lab
or 363 Atomic Physics Lab Core Requirements

## Eighth Semester

Phy 361 Atomic Physics
or 380 Nuclear Physics
Phy 363 Atomic Physics Lab
or 382 Nuclear Physics Lab
Phy 392 Senior Projects II
Science Electives
Core Requirements
6
3

[^7] thenitis 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

Eng 101 Composition Mth 111 Calculus I
Phy 201 General Physics
Core Requirements
PE 100 Activity

## Third Semester

Chm 115 Elements \& Compounds Mth 211 Differential Equations Phy 221 Elect. Instrumentation Core Requirements PE 100 Activity

Fifth Semester
Bio 115 Human Anat. \& Phys. Chm 231 Organic Chemistry Phy 323 X-Ray Diffraction or Science Elective Core Requirements

Phy 323 X-Ray Diffraction
or Science Elective
Phy 325 Med. \& Health Phys. I Phy 330 Optics
Phy 390 Practicum
Phy 391 Senior Projects I Core Requirements

## Second Semester

Eng 102 Composition II Mth 112 Calculus II Phy 202 General Physics II Computer Science Elective Core Requirements PE 100 Activity

## Fourth Semester

 Chm 116 Chemical Reaction Egr 250 Biomedical Engineering Phy 203 General Physics IIICore Requirements
PE 100 Activity

## Sixth Semester

 Bio 116 Human Anat. \& Phys. Chm 232 Organic Chemistry II Phy 380 Nuclear Physicsor 361 Atomic Physics Phy 382 Nuclear Physics Lab or 363 Atomic Physics Lab Science Elective Core Requirements

## Eighth Semeste

 Phy 326 Med. \& Health Phys. II Phy 361 Atomic Physicsor 380 Nuclear Physics
Phy 363 Atomic Physics Lab
or 382 Nuclear Physics Lab
Phy 390 Practicum
Phy 392 Senior Projects II Core Requirements

PHY 101-102. PHYSICAL SCIENCES
Three credits each Acourse for the non-science student to enable an understanding and appreciation of the unierse in which he/she lives. The methods, concepts, and vocabulary of physics and the applications of some of the outstanding principles to the needs of the individual and the community form the focus of the courses. Also, the manner in which the continually expanding frontiers of science affect our lives in the present and how they may affect our lives in the future are adtressed in both courses. The class meets for three periods per week: these include two periods of lecture, and one recitation/laboratory experience provided.
Prerequisite: No previous background in science or mathematics is required for this course.
PHY 105-106. INTRODUCTORY PHYSICS
Four credits each In 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 termodynamics. Second semester: sound, light and optics, electricity and magnetism, modconcepts. Demonstration-lecture two hours a week, recitation one hour a week, and one n con ery three hours a week. Fee: \$ hooratory three hours a week. Fee: $\$ 40$ per semester

PHY 201. GENERAL PHYSICS I
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 aboratory 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, recitaElectricity and magnetism, optics and light. Demonstration-lecture
tion one hour a week, and laboratory three hours a week. Fee: $\$ 40$.
Prerequisite: Phy 201 or Phy 105.
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 tpplication 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 environPrerequisite: Phy 201, 202

PHY 211. STATICS \& DYNAMICS
This course develops the principles of Newtonian mechanics with applications to the equilibfium 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 kinenatics of particles and rigid bodies. (same as Egr 231)
Prerequisite: Phy 201 or Phy 105, 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
Prerequisite: Egr 231 or Phy 211.

## PHY 221. ELECTRONIC INSTRUMENTATION

Three credits An introduction to the nature and use of standard and specialized electronic instruments. Thy sudy of analog and digital circuits with emphasis on the useful functions which can be pet ormed. A two-hour class and one three-hour laboratory a week. Fee: $\$ 35$.
Prerequisite: Phy 202 or Phy 106 or junior standing in the sciences.

## PHY 225. SYNOPTIC METEOROLOGY

Four crediss
Topics include surface and upper-air weather systems, weather phenomena, climate, and local weather influences. Synoptic map analysis and interpretation are emphasized. Three hourslec ture and three hours laboratory. Fee: $\$ 40$.

## PHY 228. PRINCIPLES OF ASTRONOMY

Four creditit
Topics include orbital mechanics, results of planetary probes, spectra and stellar evolution, ani cosmology. Three hours lecture and three hours laboratory. Fee: $\$ 40$

## PHY 301-302. MATHEMATICAL METHODS IN PHYSICS

 AND THE SCIENCESThree creditsead Study of different areas of mathematics and their applications in physics, engineering, and tre sciences. Topics include: ordinary and partial differential equations, Fourier methods, com plex variables, matrix methods, Green's functions, tensor analysis, group theoretical methots nd others. Three hours lecture-discussion a week.
Prerequisite: Mth 211, Mth 212

## PHY 310. ANALYTICAL MECHANICS

Three credits An intermediate level course designed to develop an understanding of the principles of mechan:ics based on the Newtonian as well as the Lagrangian and Hamilton formulations. The appliap mech matrices, tensors, and differential equations and advanced techniques to the soluand mechanics problems. Topics include harmonic oscillations, central force problems, nigidat motions, inertia and stress tensors, elastic waves, eigenvalue problems, normal coordinatio Prite symmetry groups. Recitation-lecture three hours a week.
Ficrequisite: Mth 211, Mth 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 -狍 diffraction techniques. Three hours lecture and one three-hour laboratory a week. Fee: $\$ 45$. 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 mitale and the various techniques of scanning and image formation. Also included will be the topics d dosimetry, lasers in medicine, computer amsted diagnoses and other areas of interest to medial
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 deai than in the introductory course. Image formation, refraction, diffraction, origin of spectre polarized light, optical activity, etc. Three hours class and one three-hour laboratory a wet Fee: \$40
Prerequisite: Phy 202.
PHY 331. ELECTRICITY \& MAGNETISM I
Three credils
Vector analysis. The concept of fields. Dielectric and magnetic media; fields in conductron 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.
Prerequisite: Mth 211, Phy 202.
PHY 332. ELECTRICITY \& MAGNETISM II
Development of Maxwell 's equations and boundary-value problems. Plane wave propagation Ind 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.
Prerequisite: Phy 331.
PHY 333. ELECTRICITY \& MAGNETISM LAB I
One credit
One credit ent in distributed ysts are performed which illustrate fundamental electromagnetic field conthe sudents and repoms and in lumped element circuits. Experiments are partially planned Fee: $\$ 40$.
Corequisite: Phy 331.
PHY 334. ELECTRICITY \& MAGNETISM LAB II
One credit
Acontinuation of Phy 333 with emphasis on transmission line concepts and the interaction of lectromagnetic fields and matter. One three-hour laboratory a week. Fee: $\$ 40$
Prerequisite: Phy 333.

## 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. Lecturediscussion three hours a week.
Prerequisite: Phy 106 or Phy 202, Mth 211 or Mth 212.
PHY 351. QUANTUM MECHANICS
Three credits An introduction to Quantum mechanics. Schrodinger's equation and its application to the po-tential-well, the harmonic oscillator, and the hydrogen atom. Angular momentum perturbation theory. Identical particles; Pauli's exclusion principle. The Dirac relativistic wave equation and he origin of electron spin. Lecture-discussion three hours a week.
Prerequisite: Phy 301 or Mth 361 or Phy 310.
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, spe-
 dome statics with simpl applications to solids. Three hours lecture-discussion 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 pliting 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 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 credils
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 specialy 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 credi Design and development of selected projects in physics and other related fields under the direc: tion 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 direc tion 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 393-394. ADVANCED LABORATORY
One to three credits each
Laboratory projects in fundamental or applied physics. A topic must be chosen in consulation with a faculty supervisor. Fee: $\$ 45$

Prerequisite: 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. Prerequisite: Senior standing and approval of department chairman.

PHY 397. SENIOR SEMINAR
One to three credits
Presentations and discussion of selected topics.
Prerequisite: Senior standing or by special departmental permission.

## PHY 198/298/398. TOPICS IN PHYSICS

Variable credir 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.

## POLITICAL SCIENCE

Professor Berlatsky, Chairman; Professors Emeritii Driscoll, Kaslas, Leach; Professors Cox, Hardagen, Rodechko, Shao; Assistant Professors Bauzon, Behuniak-Long, Berg, Meyers, Tuhy; Adjunct Professor Thomas.
Total minimum number of credits for a B.A. degree - $\mathbf{1 2 0}$.
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 120 hours. These include 45-65 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 Degree in Political Science

First Semester
Eng 101 Composition I
3
PS 102 American Government or PS 105 Comparative Government Core Requirements
PE 100 Activity

## Third Semester

PS 201 Political Theory
Core Recuirements
PE 100 Activity

Second Semester
Eng 102 Composition II PS 102 American Government or PS 105 Comparative Government

Core Requirements
PE 100 Activity

Fourth Semester PS 202 International Relations PS 238 Concepts and Methods pts and Methods Core Requirements PE 100 Activity

## Fifth Semester

Major Electives
Free Electives

Seventh Semester
Major Electives
Free Electives

## Recommended Course Sequence for Concentration in Public Administration

## First Semester

Eng 101 Composition I
PS 102 American Government or
PS 105 Comparative Government Ec 101 Principles of Economics Core Requirements PE 100 Activity

## Third Semester

PS 201 Political Theory
Major Electives
Core Requirements
PE 100 Activity

Fifth Semester
Public Administration Electives (Two Courses from PS 218, 314, 316, $318,319,354$, or 398
Core Requirements
Free Electives

## Seventh Semester

Public Administration Electives (One course from PS 218, 314, 316 $318,319,354$, or 398 ) Free Electives

Second Semester Eng 102 Composition II PS 102 American Government or PS 105 Comparative Government Mth 150 Statistics Core Requirements PE 100 Activity

## Fourth Semester

 PS 202 International Relations PS 238 Concepts and Methods Core Requirement PE 100 ActivitySixth Semester
Public Administration Electives (Two Courses from PS 218, 314, 316, $318,319,354$, or 398) Free Electives

## Eighth Semester

 PS 354 Practicum* Free ElectivesPS 102. INTRODUCTION TO AMERICAN POLITICS

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, A survey of major issues and problems underlying the relations among nations. The domestic 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

PS 312. INTERGOVERNMENTAL RELATIONS
Three credit
Analysis of the process by which multiple public jurisdictions interact in the United States Fed eral 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 evovived 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 credit
An examination of the political and administrative aspects of the government budgeting proc: ess, 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 credit 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 govern ment 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 interrelz. tionship 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 Amer The political process in the lesser-developed areas of the world: Asia, Africa, and Latin Amerthe Western world and the Communist states.

Prerequisite: PS 105 or consent of instructor
Offered in alternate years.
HST 328. U.S. FOREIGN POLICY

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
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
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
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
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
Internhhip or similar experience in administrative office, community agency, election campaign, or work related to administration or politic
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

Prerequisite: Approval of department.
Offered every semester.

PS 397. SEMINAR
Presentations and discussions of selected topics by students.
PS 198/298/398. TOPICS IN POLITICAL SCIENCE/ TOPICS IN POLICY ANALYSIS

Three credits

A study of topics of special interest not extensively treated in regularly offered courses. Exam ples 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 specific field of public policy, such as Energy, Environmental Science, Mental Health and R rdation, etc., may be offered also.
Prerequisite: Permission of department, criterion depending on topic.

## PRE-LAW

Wilkes College has a long and successful tradition of preparing students for law school. Currently, more than half the judges on the Luzerne County Bench are graduates of Wilkes.

Wilkes' liberal education provides the best foundation for a legal caree and has allowed its graduates to gain admittance to law schools not only in Pennsylvania but throughout the nation

## Pre-Law Curriculum

The Law School Admissions Council has declared that a specific pre-law curriculum is a "myth". Students who wish to attend law school can majo in any subject. Business, Political Science, English and History are the mos common majors, but students with majors in Engineering, Biology, Psychology, Math or any other field would be equally likely to gain admittance to law school
Students should pay special attention to developing skills in English composition, public speaking and logical thought by taking courses that emphasize those skills. Since the key factors in law school admissions are grade point average and LSAT (Law School Admission Test) Scores, students need to be aware of the need to develop a positive academic record from the outset of their college careers.
Complete information on law school admission requirements can be obained from pre-law advisor, Dr. Joel Berlatsky, in Capin Hall, Room 21. Regular meetings of pre-law students are held to answer questions and provide information about law schools and legal careers

## PRE-MEDICAL AND PRE-DOCTORAL PROGRAMS

Wilkes College offers pre-professional programs in Medicine, Dentistry, Podiatric Medicine, Optometry and Veterinary Medicine.
The Pre-Medical Program at Wilkes College 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 to cite a few. A number of Wilkes College students also enter Osteopathic Medical schools, such as the Philadelphia College of Osteopathic Medicine.
The pre-medical curriculum at Wilkes College 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 as well as other 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-medical or other pre-doctoral programs follows the semester by semester breakdown 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 College 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 wellsuited 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 College 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
These three programs require only three (3) years of study at Wilkes Col lege before entering professional school. Decisions on admission to the professional school are made by action of a joint selection committee of Wilkes College Faculty and Professional School Faculty following three years of study at Wilkes College. Students enrolling in the affiliated programs wil generally follow a program of study which is shown below.

## Wilkes College Affiliated Programs in Dentistry/Optometry/Podiatric Medicine

## First Semester

Bio 121 Principles of Modern Biology I 4
Chm 115 Elements and Compound Eng 101 Composition !
Mth 105 Calculus for Life Managerial
Mth 105 Calculus for Life, Managerial
and Social Sciences Ior
Mth 111 Calculus
Free Electives
PE 100 Activity

Third Semester
Chm 231 Organic Chemistry I Psy 101 General Psychology Free Electives PE 100 Activity

Fifth Semester
Phy 105 Introductory Physics or Phy 201 General Physics Free Electives

$$
\overline{15-18}
$$

$$
\frac{12-14}{16-18}
$$

Second Semester Bio 122 Principles of Modern Biologyll Chm 116 The Chemical Reaction Eng 102 Composition II Mth 106 Calculus for Life, Manageria and Social Sciences II or Mth 112 Calculus II Mth 112 Calcu
Free Electives PE 100 Activity

$$
\text { PE } 100 \text { Activity }
$$

## Fourth Semester

Chm 232 Organic Chemistry II Free Electives Free Electives PE 100 Activity Health Profession Orientation

Sixth Semester Phy 106 Introductory Physics or Phy 202 General Physics II Free Electives$\begin{array}{r}4 \\ 12 \cdot 14 \\ \hline 10.10\end{array}$
$16-18$

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 Col. lege will award the Bachelor of Science degree.
1Students in the optometry program must take Mth 150 - statistics.
2Must include the core educational requirements.

## PRE-PHARMACY PROGRAM

Wilkes College 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 College and contain coursework listed below.

## Two Years at Wilkes College

## First Semester

8i0 121 Principles of Modern Biology I Chm 115 Elements and Compounds Eng 101 Composition I
th 105 Calculus for Life, Managerial, and Social Sciences I or Wht 111 Calculus I ree Electives

| 4 |
| ---: |
| $0-3$ |
| $15-18$ |

Third Semester
Chm 231 Organic Chemistry I Phy 105 Introductory Physics or Phy 201 General Physics I
Ec 101 Principles of Economics I Free Electives
$-\quad 16-18$

## Second Semester

Bio 122 Principles of Modern Biology II 4 Chm 115 The Chemical Reaction Eng 102 Composition II
Mth 106 Calculus for Life, Managerial,
and Social Sciences II or
Mth 112 Calculus I
Free Electives

Fourth Semester
Chm 232 Organic Chemistry II Phy 106 Introductory Physics or Phy 202 General Physics II Free Electives

Following completion of these two years successfully, students are eligible to be admitted to the final three years of pharmacy school at Temple University. All prerequisite courses listed above, e.g. Bio 121, Chm 115, etc., must be completed with a grade of at least 2.0 .

## PSYCHOLOGY

Asscciate Professor Charnetski, Chairman; Professor Riley; Associate Professors Bohlander, Setten; Adjunct Professor Kanner
Total minimum number of credits for a 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 i p planning graduate study. The General Core Requirements must be salisfied 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.

Psy 211-212 Experimental Psychology
Psy 203 Contemporary Psychological Theories
Psy 213 Physiological Psychology
Psy 214 Sensory and Perceptual Processes

## Interest Area II.

Psy 221 Developmental Psychology
Psy 232 Human Behavior
Psy 331 Abnormal Psychology
Psy 255 Social Psychology

## Interest Area III

Psy 242 Psychological Tests
Psy 243 Industrial Psychology
Psy 245 Clinical Psychology
Students who choose to minor in psychology are required to take psychology 101 and psychology 215 and an additional twelve credits in advanced psychology courses.

First Semester
sy 101 General Psychology* Eng 101 Composition I
Core Requirements
PE 100 Activity

## Third Semester

sy 215 Research and Design Core Requirements
PE 100 Activity

## Fifth Semester

Psy 211 Experimental Psychology I $\dagger$ Major Electives Free Electives

## Second Semester

## Major Electives

Eng 102 Composition II
Core Requirements PE 100 Activity

## Fourth Semester

Major Electives
Core Requirements
Free Electives
PE 100 Activity

## Sixth Semester

Psy 212 Experimental Psychology II $\dagger$ 3 Major Electives
Free Electives

## Seventh Semester

Ssy 395 Independent Research $\dagger$ Cooperative Education $\dagger$
free Electives

Eighth Semester Psy 396 Independent Research $\dagger$ Free Electives
trecommanted

PSY 101. GENERAL PSYCHOLOGY
Three credits each
An introduction to the field of psychology with emphasis on objectives and systematic method 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 eemphasis on contemporary readings.
Prerequisite: Psy 101.
PSY 203. CONTEMPORARY PSYCHOLOGICAL THEORIES Three credits In 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 he 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 essults of modern psychological research. The course includes a study of several of the famous tessits of modern psychological research. The course includes a study of several of the famous hore recent methods of experimental research. Lecture and laboratory. Fee: $\$ 35$ each semes ter.
Prerequisite: Psy 215.
PSY 213. PHYSIOLOGICAL PSYCHOLOGY
Four credits A study of the physiological mechanisms mediating behavior. Emphasis on the structure and unction of the nervous system and the neurophysiological bases of sensory processes, emolion, abnormal behavior, sleep, learning and memory. Laboratory experience includes brain disection, small animal experimentation, and demonstrations of neurosurgical technique. en: $\$ 15$.
Prerequisite: 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 credilis
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. Psycio social development as well as physical, language, and intellectual development are considere. Prerequisite: Psy 101

PSY 232. HUMAN BEHAVIOR
Human adjustment and maladjustment to life situations with emphasis on motivation, emo ional 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 suide ed. This course is a prerequisite for Psy 245.
Prerequisite: Psy 101
PSY 243. INDUSTRIAL PSYCHOLOGY
Three credils
A survey of the applied areas of personnel, organizational, human factors, and consumer ps. chology
Prerequisite: Psy 101.
PSY 245. CLINICAL PSYCHOLOGY
Three credil
A survey of the clinical method in psychology with consideration of diagnostic and treatmen techniques and the role of the professional psychologist in various settings. Prerequisite: Psy 242 and Psy 331.
PSY 255. INTRODUCTION TO SOCIAL PSYCHOLOGY
Three credit
A general survey of the field of social psychology. Social factors in human nature; psycholog of individual differences; social interaction; collective behavior, psychology of personali social pathology.
Prerequisite: 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 oft havioral adaptations, and to behavioral comparisons among species. Topics include the fied 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 indivi uals. Major emphasis is placed on the diagnosis, psychological assessment, and clinical obser vation of three types of exceptionality: the mentally defective, gifted, and sensory-motor in paired.
Prerequisite: Psy 101 and Psy 221.
PSY 331. ABNORMAL PSYCHOLOGY
Three credits
A general survey of the principle forms of mental abnormalities, with emphasis on cause symptoms, course, and treatment.
Prerequisite: Psy 232.

## PSY 395-396. INDEPENDENT RESEARCH

 tion of a staff member. A research paper at a level significantly beyond a term paper is reauired Prerequisite: Approval of department chairman is requiredSY 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.
PSY 198/298/398. TOPICS IN PSYCHOLOGY
Variable credit
A study in topics of special interest not extensively treated in regularly offered courses.

## RUSSIAN AND OTHER LANGUAGES

## Associate Professor Karpinich.

The Department of Language 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, and Latin. Interested students should contact the department chairman.

RUS 101-102. ELEMENTARY RUSSIAN
Three credits each
Fundamentals of spoken and written Russian, and introduction to Russian culture. Includes ystematic coverage of basic Russian grammar. Work in language laboratory required. Not rcommended 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 urther 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 calure. Includes systematic coverage of basic grammar supplemented with work in language abboratory where appropriate.

203-204.
Three credits each
Continued study of grammar and development of proficiency in basic language skills. ExerContinued study of grammar and development
Prerequisite: 102 or permission of instructor.
108/208. STUDIES IN LANGUAGE AND CULTURE
Three credits hivesigation of an aspect of the selected language and culture. May be repeated for credit. Prerequisite: Permission of instructor.

SOCIOLOGY
Associate Professor Natzke, Chairman; Associate Professor Brown; Assistant Professors Gart and Tutwiler; Adjunct Professor Tomkiewicz.
Total minimum number of credits required for a B.A. degree -121 . Total minimum number of credits required for a minor - 18 .

The Department of Sociology and Anthropology offers a comprehensive program of studies which is very competitive with most departments of its size in the country. We have a high quality faculty, all of whom hold the Ph.D., excellent learning and research facilities, on-going interdisciplinary programs with other departments in the College, a wide variety of opportunities for internships in professional settings which integrate a student's academic studies with productive work experiences, and an active Study Abroad program. The curriculum is committed to offering 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.
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 B.A. degree with 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 anthropology 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 399, 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 chairman 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 399, a supervised practical field experience, designed for sociology minors, in a professional setting. The six hours carned in Practicum may not be applied toward the eighteen hours required for the minor. Approval of the department chairman 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 115.

Recommended Course Sequence for Sociology Majors

| 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 |  |
| PE 100 Activity | $\underline{0}$ | PE 100 Activity | $\underline{0}$ |  |
|  |  |  |  |  |

Third Semester Core Requirements Major Electives Free Electives PE 100 Activity

| Fourth Semester |  |  |
| ---: | :--- | ---: |
| 9 | Core Requirements | 9 |
| 3 | Major Electives | 3 |
| 3 | Free Electives | 3 |
| $\frac{0}{15}$ | PE 100 Activity | $\underline{0}$ |
|  |  | 15 |

Fitth Semester Soc 255 Social Psychology Major Electives Core Requirements Free Electives

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Seventh Semester
Soc 370 Methods*
Free Electives

The College of Arts and Sciencr
The College of Arts and Sciences
SOC 241. THE SOCIOLOGY OF MENTAL DISORDERS
Reviews major sociological approaches to the generation and treatment of psychiatrice credits ders. Attention is given to anti-psychiatric theories of mental disorders which construe 'mental ders. Attention is given to anti-psychiatric
disorders' as primarily social phenomena.
Prerequisite: 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.
Prerequisite: 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 pat-
terns of economic, political, and prestige inequalities among collectivities. A special effort is terns 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.
very poor.
Prequisite: 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 10 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 soPrerequisite: Soc 101 imerican, European, Asiatic, and African countries.

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.
S0C 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 seclors 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
A theoretical analysis of inter-group tensions and processes of adjustment with special refer ence 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 sociol ogy as well as for clarification of its distinct subject matter, problems, and methods.
Prerequisite: Soc 101, or approval of instructor.

## SOC 394. SOCIOLOGICAL ANALYSIS

Three credits
The systematic critical evaluation of data by means of concepts and methods consistent with here 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 direc tion 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

Presentations and discussions of selected themes and issues in sociology.
Prerequisite: Criteria will vary according to content of seminar.
SOC 198/298/398. TOPICS
Variable credit SOC 399. PRACTICUM
courses.
A supervised Six credits professional setting.


## SPANISH

Associate Professor Karpinich.
Total minimum number of credits required for a B.A. degree - $\mathbf{1 2 0}$ Total minimum number of credits required for a minor - 18 .

A major in Spanish consists of twenty-four credit hours in advanced lan guage courses beyond the 204 course. These twenty-four credits must normally include 301-302. Students seeking public school certification must also take $205,206,207,208$ or 209 , and 350 ; and in addition to the required twenty-four credit hours, 390 and English 222. In order to enhance their command of language and their understanding of culture, majors are urged to spend a summer or semester abroad.
Students majoring in Spanish may elect 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 Language and Literature, Room 201 Kirby Hall.
A minor in Spanish shall consist of eighteen credit hours beyond 102.

## Recommended Course Sequence for a Degree in Spanish

First Semester Second Semester
Eng 101 Composition I 3 Eng 102 Composition II

## Fourth Semester

 Sp 204 Intermediate IICore Requirements
PE 100 Activity


Fifth Semester
Sp 205 Conversation
Major Electives
Free Electives

Seventh Semeste
Major Electives
Free Electives
$\begin{array}{r}6 \\ 9 \\ \hline 15\end{array}$

Sixth Semester Sp 206 Advanced Conversation Major Electives
Free Electives

Eighth Semester
Major Electives Free Electives

SP 101-102. ELEMENTARY SPANISH
Three credits eac
undamentals of spoken and written Spani systematic coverage of basic Spanish grammar. Work in recommended for students having completed two or more years of high schoolsplin

SP 203-204. INTERMEDIATE SPANISH
Three credits eac
Emphasis on development of proficiency in spoken and written Spanish. Includes reviea further study of grammar. Oral and written work based upon short cultural and literary 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 discus sions, 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 expres. Sion. Discussions, reports, debates, and written compositions on topics of current interestiin 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 ora 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 Spanist 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 Prerequista) 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 Development of a particular language skill or investigation of an aspect of Spanish culture.
Possible topics include translation, commercial Spanish, Spanish for Health Science Possible topics include translation, commercial Spanish, Spanish for Health Science Carcer Prerequisite: Sp 204 or permissan Forklore, and othe

## P 301-302. SURVEY OF SPANISH LITERATURE

Three credits each Survey of representative works from the middle ages to the present. Introduction to major novements, 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 f 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 chairman
SP 395-396. INDEPENDENT RESEARCH Prerequisite: Approval of department chairman

SP 397. SEMINAR
(Maximum of three credits per student) One to three credits Presentations and discussions of selected topics.
Prerequisite: Approval of department chairman
SP 198/298/398. TOPICS
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.

## SPEECH, COMMUNICATIONS, AND THEATER ARTS

Professor Emeritus Holm; Associate Professors Kinney, O'Neill; Assistant Professors ElmesCrahall, Schulman; Endowed Chair, Bigler; Engineer, Brigido.

Total minimum number of credits required for a B.A. degree $\mathbf{- 1 2 0}$. Total minimum number of credits required for a minor - 18 .

The Department of Speech, Communications, and Theater Arts has concentrations in Rhetoric and Public Communication; Interpersonal and Organizational Communication; Telecommunications (Broadcasting); Journalism; and Theater Arts. 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 that student to advance beyond the entry level in his/her chosen field or even to change fields entirely. We believe the curriculum also affords ample opportunity for the student to explore other disciplines.

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 SCT 101 Fundamentals of Speech or SCT 102 Principles of Communication
Electives: Five of the following:
SCT 202 Interpersonal Communication SCT 203 Small Group Communication SCT 206 Business and Professional Speaking SCT 301 Persuasion
SCT 302 Public Relations
SCT 303 Organizational Communication
2. Rhetoric and Public Communication Minor

Required: Either SCT 101 Fundamentals of Speech or SCT 102 Principles of Communication
Electives: Five of the following:
SCT 201 Advanced Public Speaking SCT 203 Small Group Communication SCT 204 Argumentation and Debate SCT 206 Business and Professional Speaking SCT 300 Rhetorical Criticism
SCT 301 Persuasion
SCT 302 Public Relations
3. Telecommunications Minor

Required: SCT 220 Intro. to Telecommunications
Electives: Five of the following:
SCT 221 Basic Audio Production
SCT 222 Basic Video Production
SCT 223 The Art of Film
SCT 224 Mass Media
SCT 321 Broadcast Journalism
SCT 322 Advanced Video Production
SCT 362 Mass Communications Law
4. Journalism Minor

Required: SCT 260 Basic Newswriting
Electives: Five of the following:
SCT 224 Mass Media
SCT 254 Publication Design
SCT 261 The American Newspaper
SCT 360 Editing and Advanced Newswriting
SCT 361 Feature Writing
SCT 362 Mass Communications Law

## 5. Theater Arts Minor

Required: SCT 143 Theatrical Production
Electives: Five of the following:
SCT 142 Speech for the Stage
SCT 240 Fundamentals of Play Structure and Criticism
SCT 241 Acting I
SCT 242 Acting II
SCT 340 Theater History I
SCT 341 Theater History II
CT 342 Lighting for the Stage
SCT 344 Scene Design
SCT 345 Directing I
SCT 346 Directing II

## The Major

## Departmental Requirements:

All students choosing to major in Speech, Communications, and Theater Arts must fulfill specific departmental requirements. These courses contain skills, the ory, analysis, performance, writing, and research. They are as follows:
SCT 100 Modes of Expression
SCT 101 Fundamentals of Speech
SCT 102 Principles of Communication
(Not required of Theater Arts concentrators.)
SCT 324 Communication Research Methods
(Not required of Theater Arts concentrators.)
SCT 397 Senior Seminar
The Department also has a six-hour writing requirement for all communication majors and a dramatic literature requirement for theater majors.

Concentration Requirements:
Each concentration is described and outlined below.

## 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:

SCT 202 Interpersonal Communication
SCT 203 Small Group Communication
SCT 206 Business and Professional Speaking
SCT 252 Internship
(Only three credits of internship may count in the concentration.)
SCT 301 Persuasion
SCT 302 Public Relations
SCT 303 Organizational Communication
Writing Requirement ( 6 credits):
SCT 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 meel 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

SCT 201 Advanced Public Speaking
SCT 203 Small Group Communication
SCT 204 Argumentation and Debate
SCT 206 Business and Professional Speaking
SCT 252 Internship
(Only three hours of internship may count in the concentration.
SCT 300 Rhetorical Criticism
SCT 301 Persuasion
SCT 302 Public Relations

## Writing Requirement (6 credits)

ENG 201 Advanced Composition and
SCT 260 Basic Newswriting or
SCT 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 al 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 ConcentrationsFirst Semester
Eng 101 Composition I SCT 100 Modes of Expression SCT 101 Fundamentals of Speech Core Requirements
PE 100 Activity

Third Semester
Concentration Selection Witing Requirement Core Requirements PE 100 Activity

Second Semester
Eng 102 Composition II 3 SCT 102 Principles of Communication Core Requirements

Fourth Semester
Concentration Selections 6 Writing Requirement 3 Core Requirements PE 100 Activity

Sixth Semester
Concentration Selection Internship (See Advisor) Core Requirements (If necessary) Free Electives

## Eighth Semester

SCT 324 Communication Research 3 Methods
SCT 397 Senior Seminar
3
Free Electives

## 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: SCT 220 Introduction to Telecommunications

All students concentrating in Telecommunications will then choose five courses ( 15 credits) from the following:

SCT 221 Basic Audio Production
SCT 222 Basic Video Production
SCT 223 The Art of Film
SCT 224 Mass Media
SCT 252 Internship
(Only three credits of internship may count in the concentration.) SCT 321 Broadcast Journalism
SCT 322 Advanced Video Production
SCT 362 Mass Communications Law

## Writing Requirement ( 6 credits):

SCT 225 Media Criticism or
SCT 260 Basic Newswriting and
ENG 201 Advanced Composition

## Recommended Course Sequence for <br> Telecommunications Concentration

First Semester
Eng 101 Composition I
SCT 100 Modes of Expression SCT 101 Fundamentals of Speech Core Requirements
PE 100 Activity

Third Semester
SCT 102 Principles of Communications 3 Concentration Selection
Writing Requirement Core Requirements
PE 100 Activity

## Fifth Semester

| Concentration Selection | 3 | Concentration Selection |
| :--- | :--- | :--- |
| Core Requirements | 6 | Internship (See Advisor) |
| Major Electives | 3 | Core Requirements (If necessary) |
| Free Electives | $\frac{3}{15}$ | Free Electives |

## Second Semester

 Eng 102 Composition II SCT 220 Intro. to Telecommunications 3 Core Requirements PE 100 Activity
## Fourth Semester

Concentration Selection Writing Requirement Core Requirement PE 100 Activity

## Sixth Semester

 Concentration Selection Core Requirements (If necessary) Free Electives
## Seventh Semester

 Inernship (See Advisor) Concentration Selection Major Electivesree Electives

## Eighth Semester

SCT 324 Comm. Research Methods 3 SCT 397 Senior Seminar Free Electives

## 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:
SCT 224 Mass Media
SCT 254 Publication Design
SCT 260 Basic Newswriting (may not be used to fulfill concentration requirement if already used to fulfill writing requirement)
SCT 261 The American Newspaper
SCT 360 Editing and Advanced Newswriting
SCT 361 Feature Writing
SCT 362 Mass Communications Law
Writing Requirement (6 credits):
SCT 260 Basic Newswriting
ENG 201 Advanced Composition

## Recommended Course Sequence for Journalism Concentration

## First Semester

Eng 101 Composition I
SCT 100 Modes of Expression
SCT 101 Fundamentals of Speech Core Requirements
PE 100 Activity

## Third Semester

| Concentration Selection | 3 |
| :--- | ---: |
| Witing Requirement | 3 |
| Core Requirements | 9 |
| PE 100 Activity | $\mathbf{0}$ |
|  | $\mathbf{1 5}$ |

## Second Semester

## Fourth Semester

## Concentration Selections

 Writing Requirement Core Requirements PE 100 Activity6

Fifth Semester
Concentration Selection
Core Requirements
Major Electives
Free Electives

## Seventh Semester

Internship (See Advisor)
Concentration Selection
Major Electives
Free Electives

## Eighth Semester

SCT 324 Comm. Research Methods SCT 397 Senior Seminar Free Electives

## Sixth Semester

## oncentration Selection

Internship (See Advisor) Core Requirement (If necessary) Free Electives

## Recommended Course Sequence for Theater Arts Concentration

> First Semester
> Eng 101 Cumposition SCT 100 Modes of Expression SCT 143 Production SCT 241 Acting I or Core Requirement Core Requirements PE 100 Activity

## Third Semester

SCT 240 Play Structure and Criticism 3 SCT 241 Acting or Core Requirement 3 crast linting for the Stage SCR 342 Lighting for the Stage 3 ENG 151 World Literature I Core Requirements SCT 141 Theater Laboratory PE 100 Activity

## Second Semester

Eng 102 Composition II SCT 101 Public Speaking SCT 142 Speech SCT 142 Speech for the Stage Core Requirements SCT 141 Theater Laboratory PE 100 Activity3
3

## Fourth Semester

SCT 334 Scene Design I
SCT 242 Acting II or Theater Elective ENG 152 World Literature II Core Requirements SCT 141 Theater Laboratory PE 100 Activity

## Fifth Semester

SCT 340 Theater History
SCT 345 Directing I
Dramatic Literature Requirement
Core Requirements
SCT 141 Theater Laboratory

Seventh Semester

## SCT 397A Senior Seminar

 Dramatic Literature Requirement Core RequirementSCT 252 Internship or Free Elective
SCT 141 Theater Laboratory

## Eighth Semester

SCT 348 Workshop or
Theater Elective
SCT 252 Internship or Free Elective Free Electives


## SCT 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 art cles, as well as radio and television programming, speeches, and films. Critical principles wil be applied.

## SCT 240. FUNDAMENTALS OF PLAY STRUCTURE

AND CRITICISM
Three credits
A study of critical techniques in interpreting plays and the application of such techniques valuating plays for stage presentation. (Formerly Th. Arts 201)
Prerequisite: Eng 102 and Sct 100
SCT 241. ACTING I Three credit
Basic acting techniques. Creating a variety of characters for the stage through the use of voca
Three credits
SCT 241. ACTING I
Basic acting techniques. Creating a variety of characters for the stage through the use of voal interpretation, physical movement, improvisation, and theater games. (Formerly Th. Ats 211)

SCT 242. ACTING II
An introduction to the major theories, aims, and styles of acting through performing various
SCT 242. ACTING II
An introduction to the major theories, aims, and styles of acting through performing various An introduction to the major theories, aims, and styles of acting through per
roles and monologues in selected dramatic scenes. (Formerly Th. Arts 212) Prerequisite: Sct 241 .

## SCT 252. INTERNSHIP

Three to six credils
A supervised program of work and study in any of the concentrations. Permission of the depart ment is required.

SCT 254. PUBLICATION DESIGN
Three credits
Familiarization with the tools, design elements, and production processes of the graphic artist Familiarization with the tools, design elements, and production processes of the graphic artist ence methods and techniques currently being practiced in the graphic design field. It is sur gested that students without an art background take Art 103 prior to this course. (Same as An 254)

## SCT 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 Sct 100. Offered every fall semester
SCT 261. THE AMERICAN NEWSPAPER
Three credits
Three credits A survey of contemporary newspapers emphasizi
ation of alternative newspapers

## SCT 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: Sct 101. Spring semesters, off-numbered years

## SCT 301. PERSUASION

Study and practice of persuasive speaking. General theories of persuasion, the role of persursion in a democratic society, and an introduction to modern experimental research in the field (Formerly Speech 302)

Prerequisite: Sct 101. Fall semesters, odd-numbered years

## CT 302. PUBLIC RELATIONS

Three credits
introduction to the fundamentals of public relations practice, including program planning An inroduction to the fundamentals of publit re writing for PR, and coordinating special events and unctions. (Formerly Communication 215)
Prerequisite: Sct 202 and Sct 260 . Fall semesters.
SCT 303. ORGANIZATIONAL COMMUNICATION
Three credits Course focuses attention on traditional and modern concepts of communication channels in Course focuses attention on traditional and modern concepts of communication channels tuine wmmunication audits.
Prerequisite: Sct 202. Spring semesters, even-numbered years.
SCT 321. BROADCAST JOURNALISM
Three credits A study of the principles and methods of broadcast journalism. (Formerly Communication A stud
241)

Prerequisite: Sct 100. Course taught every other spring semeste
SCT 322. ADVANCED VIDEO PRODUCTION
Three credits
A study of the principles and techniques of program production. Scripting, producing, and directing are subjects covered extensively by this course. Each student will produce and direct half-hour final project.
Prerequisite: Sct 222 . Course taught every other spring semester
SCT 324. COMMUNICATION RESEARCH METHODS
Three credits Sudy of research methods in various areas of communication. Emphasis on ability to research iterature and critique a research design. Consideration of content analysis and empirical design.
Prerea
lin

Prerequisite: Sct 100 and 102, completion of departmental writing requirement, and junior senior standing.

## CT 340. THEATER HISTORY I

Three credits
A survey of the historical development and background of theatrical art from ancient time through the seventeenth century. (Formerly Th. Arts 331)

SCT 341. THEATER HISTORY II
Three credits
A survey of the historical development and background of theatrical art from the eighteenth entury to the present. (Formerly Th. Arts 332)
Prerequisite: Sct 340 .
SCT 342. LIGHTING FOR THE STAGE
Principles of lighting and the use of these principles in either simple or sophisticated lighting ystems. Students will work with instruments and equipment of the lighting technician. Clas and workshop. (Formerly Th. Arts 343 )
Prerequisite: Sct 141.
SCT 344. SCENE DESIGN
The nature and function of scenic art with emphasis on contemporary theories and techniques (Formerly Th. Arts 344)
Prerequisite: Sct 141.
SCT 345. DIRECTING I
An introduction to the principles of directing including play selection, composition, casting hlocking, and rehearsing. Class and workshop. (Formerly Th. Arts 351)
Prerequisite: Sct 141, 201, 211, or departmental permission.

SCT 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: Sct 351.

SCT 347. CHILDREN'S THEATER One to three credits
Methods of interpreting and performing plays for young audiences. Class projects will evolve Methods of interpreting and performing p
into theatrical performances for children.
Prerequisite: Sct 143 and 241 , or permission of the department.

## SCT 348. THEATER WORKSHOP

Three credits An opportunity to prepare the full production of a short play for an audience. Working closely 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, 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.
SCT 360. JOURNALISM: EDITING AND ADVANCED NEWSWRITING

Three credits
A study of specialized reporting and an introduction to news editing. Prerequisite: Sct 260.

## SCT 361. FEATURE WRITING

Three credits
A study of feature articles for newspapers, syndicates, magazines, and specialized publica tions. Practice in research, interviewing, and writing.

Prerequisite: Sct 160.
SCT 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: Sct 100 and 102.

## SCT 395-396. INDEPENDENT RESEARCH

One to three credits
Independent study and research for advanced students in speech, communication, and theater arts programs under the direction of a staff member. A research paper at a level significanty beyond a term paper is required.

SCT 397A. SENIOR SEMINAR/THEATER
Three credits
Discussion, research, and exploration of a selected topic in conjunction with a departmental Discussion, research, and exploration of a selected topic in conjunction with a departmental
theater production. Presentations and a research project. Required of all Theater Arts concentrators. (Formerly Th. Arts 397)

SCT 397B. SENIOR SEMINAR/COMMUNICATIONS
Three creditis
Three credit
An in-depth investigation of current research and issues in communication. Research paper required. Open to all SCT majors. (Formerly Communication 397)
Prerequisite: Junior/senior standing
SCT 398. TOPIC
One to three credits
A study of topics of special interest not extensively treated in regularly offered courses.

## Third Semester

Ed 101 Practicum
Ed 201 Intro. to Education Spl 201 Speech-Language Pathology Core Requirements Psy 325 Exceptional Individual PE 100 Activity

## First Semester

Eng 101 Composition I Psy 101 General Psychology Core Requirements PE 100 Activity

## SPEECH PATHOLOGY

Professor J. Bellucci, Chairman; Professor Emeritus Hammer; Professors Darte, Fahmy; Associate Professors Johnson, Placek; Assistant Professors B. Bellucci, Ginsburgh, G. Meyers; Instructor Polacheck.
Total minimum number of credits required for a B.A. degree - $\mathbf{1 2 5}$.
The Bachelor's Degree in Speech-Language Pathology provides a firm foundation for understanding pathologies of speech-language and their remediation. Upon completion of the program, students will be eligible for a Pennsylvania State Department of Education teaching certificate. The Speech-Language Pathology curriculum at Wilkes College is designed to prepare students for intensive study on the graduate level

## Recommended Course Sequence for a <br> Degree in Speech Pathology

Spl 301 Speech Science
Spl 303 Phonetics
Sol 305 Audiology \& Hearing Science
Core Requirements Wth 150 Elementary Statistics Eo 325 Methods \& Materials of Instruction Techniques for Exceptional Children

## Second Semester

Eng 102 Composition II
Core Requirements
CS 115 Survey of Computing
\& Data Processing
PE 100 Activity

## Fourth Semester

 Ed 102 Practicum Ed 202 Educational Psychology Spl 202 Speech \& Language DevelopmentCore Requirements
Psy 221 Developmental Psychology PE 100 Activity

## Sixth Semester

Spl 304 Advanced Speech Language Pathology
Spl 306 Auditory Habilitation \& Rehabilitation
Spl 308 Language Disorders in Children
Spl 310 Principles of Case
Management
Free Electives

## Seventh or Eighth Semester

Spl 401 Intro. to Linguistics
\& Psycholinguistics
Sp 101 Fundamentals of Speech
Ed 321 The Teaching of Reading Free Electives $\frac{6}{15}$

## SPL 201. INTRODUCTION TO SPEECH-LANGUAGE

## PATHOLOGY

Three credits Introduction to the field of speech and hearing. Includes overview of speech/language/hearing disorders, their etiologies, treatment, and psychological and social foundations of speech-lar guage pathology.

SPL 202. SPEECH AND LANGUAGE DEVELOPMENT Three credits Study of the pattern of speech and language development and consideration of theoretical er planations of this development.

SPL 301. SPEECH SCIENCE Three credits Anatomy and physiology of systems basic to speech/language/hearing functions and introduc tion to electronic instrumentation used in clinical practice.

## Seventh or Eighth Semester

 Spl 380 Professional Semester 15SPL 353. DIAGNOSIS OF MENTALLY AND PHYSICALLY HANDICAPPED

Three credits
Study of mental and physical handicaps and in-depth exploration of diagnostic techniques used ineducational planning for these individuals.

SPL 380. PROFESSIONAL SEMESTER IN
SPEECH-LANGUAGE PATHOLOGY
vation and pracExamination of professional problems common to all teachers; provides observ tice of u uatment methods for speech-language disorders and practice in development of IEPs for speech-language disorders.

## SPL 381. FIELD PRACTICUM

Three credits
Supervised field observation of individuals with speech and language disorders and experience in therapeutic planning; field assignments will be made in public schools, clinics, and hospitals.

SPL 401. INTRODUCTION TO LINGUISTICS AND PSYCHOLINGUISTICS

Three credits Study of syntax, semantics, and pragmatics, and consideration of issues in psycholinguistics, particularly with reference to applications in speech-language disorders.



## Personnel of the College

Board of Trustees
Administration
Faculty

## Board of Trustees

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## Administration

CHRISTOPHER N. BREISETH (1984), President B.A. California, Los Angeles, B. Litt. Oxford, Ph.D. Cornell

RICHARD F. CHARLES, Vice President for College Advancement
PAUL A. O'HOP, SR., Vice President for Business Affairs and Auxiliary Enterprises
CHERYL SCALESE, Director of Institutional Research

Vice President for Academic Affairs Vice President for Academic Affairs
ROBERT J. HEAMAN (1969), Associate Dean of Academic Affairs B. A. Detroit, M.A., Ph.D. Michigan

IOHN F. MEYERS (1967), Associate Dean of Academic Affairs B.A. Minnesota, M.A. Clark
paUl S. ADAMS (1979), Associate Dean of Student Affairs B.A., M.Ed. Wilkes

DORIS E. BARKER (1965), Registrar Wyoming Seminary Dean's School of Business

BARBARA BELLUCCI (1984), Director of Microcomputer Education, Regional Computer Resource Center
B.S., M.S. Wilkes, Ed.D. Temple

JOSEPH T. BELLUCCI (1967), Project Director of Title III B.S. Scranton, M.Ed., Ed.D. Lehigh

OSEPH J. CHMIOLA (1979), Director of the Small Business Institute B.A., M.B.A. Wilkes

EUGENE S. DOMZALSKI (1969), Director of Career Services B.S. Wyoming, M.S. Wilkes

MAHMOUD H. FAHMY (1968), Dean of Graduate Studies and Continuing Education B.A. Alexandria, Egypt, M.A. Columbia, Ph.D. Syracuse

JUDITH FREMONT (1985), Director of Act 101
B.S. Temple, M.S. Nazareth College of Rochester

CHERYL GIBSON (1977), Director of Cooperative Education B.A. Wilkes

ANNE A. GRAHAM (1979), Director of Project Upward Bound B.A., M.S. Wilkes

PATRICIA M. HEAMAN (1966), Director of the Writing Laboratory B.A. Wilkes, M.A., Ph.D. Pennsylvania

JOSEPH H. KANNER (1949), Director of Testing Servic
B.A. Bucknell, M.A. New School for Social Research

BARBARA KING (1980), Director of Evening, Summer, \& Weekend College B.S. Wilkes

BRADFORD L. KINNEY (1973), Director of the Campus Radio Station B.A. Florida Southern, M.A. Indiana, Ph.D. Pittsburg

JANE LAMPE-GROH (1969), Dean of Student Affair B.A. Rosary, M.A. Michigan, M.Ed. Virginia

FREDERICK A. LOHMAN (1984), Director of Small Business Development Center B.A. Wilkes

ACHAEL L. LOHMAN (1981), Director of Financial Aid B.S. Wilkes, M.Ed. Bloomsburg

THOMAS J. LYNOTT (1981), Director of Anthracite and Community Development Institute
B.S., M.S. Scranton
P. ROBERT PAUSTIAN (1984), Director of the Library B.A., M.A. Missouri, M.A. Kansas

OHN G. REESE (1955), Director of Athletic B.S., M.Ed. Pennsylvania State

RALPH B. ROZELLE (1962), Dean of Health Sciences B.S. Wilkes, Ph.D. Alfred

ANN W. RUSSIN (1984), Director of the Nursing Learning Laboratory B.S. Cornell, M.S. Misericordia

MARK F. SOWCIK (1986), Director of Campus Counseling Servic B.A. King's, M.A. Marywood

MARY SUPEY (1984), Director of Health Services B.S. Wilkes

BERNARD J. VINOVRSKI (1986), Dean of Admission B.S., M.S., M.B.A. Wilkes

AMY WIEDEMER (1985), Director of Student Activities B.A. University of Pittsburgh-Johnstown, M.S. Indiana University of Pennsylvania

OHN P. WHITBY (1947), Assistant Director of Act 101 Program B.S. Bloomsburg, M.S. Columbia

DEBRA ZEHNER (1981), Director of the Academic Support Cente B.S., M.S. Wilkes

## Vice President for College Advancement

RICHARD F. CHARLES (1984), Vice President for College Advancement A.B. Franklin and Marshal

SANDRA A. BEYNON (1982), Director of Foundations and Grants Management B.S. Scranton, M.B.A. Wilkes

JOHN J. CHWALEK (1946), Special Assistant for College Advancemen B.S. East Tennessee, M.A. Columbia

BETSY DELL CONDRON (1979), Director of Community Relation B.S. Skidmore, M.S. Wilkes

ALFRED S. GROH (1947), Special Assistant for Cultural Activities B.A. Syracuse, M.A. Columbia

THOMAS B. HADZOR (1986), Executive Director of Development B.A. Muhlenburg, M.A. Michigan State

THOMAS J. LYNOTT (1981), Special Assistant for Government Relations B.S., M.S. Scranton

JANE MANGANELLA (1975), Director of Public Relations
JUDITH HANSEN O'TOOLE (1982), Director of Sordoni Art Gallery B.A. Minnesota, M.A. Pennsylvania State

GEORGE F. RALSTON (1946), Special Assistant for Alumni Relations B.A. North Carolina, M.A. Columbia

INTHONY J. SHIPULA, II (1985), Director of Alumni Relation B.S. Wilkes

## Vice President, Business Affair and <br> Auxiliary Enterprises

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ssociate Dean, School of Engineering and Physical Sciences

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Teaching Certification: Earth and Space Science/Physics

Admissions and Standards Graduate Studies


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Pharmacy Program ..
Pharmacy Program

## Location of Frequently-Used Student Services

As this Bulletin goes to press, several offices are preparing to relocate. While this listing was accurate at press-time, students are advised that the listing may already be somewhat inaccurate.

| Academic Support Center |  | Library . . . . . . . . . . . . . . . . . . . . F |
| :---: | :---: | :---: |
| Act 101 Office |  | Part-time Studies Office . . . . . . . . . B |
| Admissions Office |  | Public Relations Office . . . . . . . . M |
| Air Force ROTC | C | Recorder . . . . . . . . . . . . . . . . . . . . K |
| Athletic Department | L | Registrar. . . . . . . . . . . . . . . . . . . . K |
| Alumni Office. |  | Residence Life Office . . . . . . . . . I |
| Bookstore |  | Student Affairs Office . . . . . M and D |
| Career Center |  | Student Union Building .......... D |
| Continuing Education Office . |  | Study Abroad Coordinator . . . . . . B |
| Cooperative Education Office |  | Summer College Office . . . . . . . . B |
| Evening College Office |  | Testing Center . . . . . . . . . . . . . . . J |
| Finance Office | K | Theater . . . . . . . . . . . . . . . . . . . . E |
| Financial Aid Office. | K | Upward Bound Office ...........K |
| Graduate School Office | H | Weekend College Office . . . . . . . . B |
| Health Services. | . D | Writing Laboratory. . . . . . . . . . . . 6 |

## Building Key

## Symbol Building and Location

A Weckesser Hall, 170 South Franklin Street

WILKES COLLEGE 987-88 ACADEMIC CALENDAR

Summer 1987 - First Day Session


Classes Commence
Classes End
Monday, June 15, 1987
Friday, July 17, 1987
(Including Final Examinations)
Second Day Session
Classes Commence
Classes End
Monday, July 20, 1987
Friday, August 21, 1987
(Including Final Examinations)
Eight-week Evening Session
Monday, June 15, 1987
Friday, August 7, 1987 (Including Final Examinations)

Fall Semester - 1987
Classes Commence
Wednesday, September 2, 1987
8:00 a.m. 12:00 noon

8:00 a.m. 12:00 noon

6:00 p.m.
10:00 p.m.

8:00 a.m.
(classes on Labor Day - September 7, 1987)
Fall Break
Classes Resume
Thanksgiving Break Thanksgiving Break Classes Resume Classes End Reading Day Wednesday, October 21, 1987 Tuesday, November 24, 1987 Monday, November 30, 1987 Tuesday, December 15, 1987 Wednesday, December 16, 1987 Thursday, December 17, 1987 Wednesday, December 23, 1987

Spring Semester - 1988
Classes Commence
Winter Break
Classes Resume

Easter Break
Classes Resume
Classes End
Nednesday, January 20, 1988
Friday, February 19, 1988
Wednesday, February 24, 1988 (Wednesday, February 24, 1988 follows Monday Class Schedule)
Friday, March 25, 1988
Tuesday, April 5, 1988
Friday, May 6, 1988
$\begin{array}{rl}\text { 5:00 a.m. } \\ \text { 8:0y } 6,1988 & 10: 00 \text { p.m. }\end{array}$

Thursday, May 5, 1988 follows Monday
Class Schedule and Friday, May 6, 1988 follows Tuesday Class Schedule)
$\begin{array}{ll}\text { Final Examinations Begin } & \text { Monday, May 9, } 1988 \\ \text { Final Examinations End } & \text { Saturday, May 14, } 1988\end{array}$
Commencement
Sunday, May 22, 1988
11:00 a.m.

# 1987-88 <br> Wikes College 

## Graduate Bulletin





## The Graduate Dean's Message

The distinctive feature of Wilkes graduate programs is that each course of study has been developed in consultation with practicing professionals in each field covered. Wilkes graduate faculty combines academicians and professionally established teacher-practitioners. Graduate classes are conveniently scheduled to accommodate the needs of both full-time and working students. Year-round courses are arranged to permit uninterrupted progress toward your educational objectives. A high quality individualized advising system has been established to insure the personalization of the educational experience. Graduate class size is designed to maximize the opportunity for student-instructor interaction. Wilkes College graduate study and research go beyond specialized fields and allow for multi-disciplinary programs which reflect the cross-fertilization of the realms of knowledge. The College cordially invites you to review the accompanying bulletin. Such review will enable you to discover the variety of offerings and the multiplicity of courses which are best suited for your present or future career goals.

Mahmoud H. Fahmy Dean of Graduate Studies and Continuing Education

## Graduate Studies 1987-1988

Wikes College is an equal opportunity and affirmative action institu ion. No applicant shall be denied admission to Wilkes College because drace, color, sex, religion, national or ethnic origin, or handicap.

## REGULATIONS SUBJECT TO CHANGE

The College reserves the right to change the requirements and regulains contained in this bulletin and determine whether a student has me is reauirements for admission or graduation, and to reject any applicant bradmission for any reason the College determines to be material to the spolicant's qualifications to pursue graduate education.

## general INFORMATION

The Graduate Division of Wilkes College was established in 1959 when he Board of Trustees authorized graduate study in the Departments of Chemistry and Physics. The first Master of Science Degrees were conered in 1965.
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. adding of graduate courses allows a full-time student to plan for continuas progress in his program
The programs also allow businessmen, engineers, scientists, teachus, and others employed in the region to continue their studies without derupting their employment. To permit a combination of work and sudy, many classes are scheduled to meet during late afternoon and arly evening hours.

## ACCREDITATION

Wikes Graduate Programs are approved and accredited by the Dewatment of Education of the Commonwealth of Pennsylvania and the IIdde States Association of Colleges and Secondary Schools.
In addition to the total program accreditation, certain special areas are pecognized by professional societies. The Chemistry curriculum is apyoved by the American Chemical Society.
Wikes College is a member of the Council of Graduate Schools in the Unted States, Pennsylvania Association of Graduate Schools. The Colegeis an Associate Member of the Association of University Programs in Heath Administration (AUPHA).

## GRADUATE DEGREE PROGRAMS

Graduate degree programs are currently offered as follows:

## DEGREE

Master of Business Administration

Master of Science
Master of Health Service Administration

## Concentration

## Marketing, Managerial

 Science, Labor, Accounting Finance, Health Care Electrical Engineering Mathematics, Physics Long-term Care Administration, Health Care Marketing, Health Care FinanceBiology, Chemistry Education, Educational Computing, Elementary Education, English, Field Education, History, Mathematics, Physics

## Wilkes College Graduate Studies Administration

Dr. Christopher N. Breiseth
Dr. Robert J. Heaman
Dr. Mahmoud H. Fahmy

President
Acting Vice President for Academic Affairs
Dean of Graduate Studies and Continuing Education

The academic departments at Wilkes College are administered under three divisions
Professor Theodore J. Engel
Dr. Umid R. Nejib
Dr. James P. Rodechko
Dean of the School of Business and Economics
Dean of the School of Engineering and Physical Sciences
Dean of the College of Arts and Sciences

Departmental course descriptions are grouped accordingly. The School of Business and Economics includes the following departments:
Accounting
Business Administration
Economics

The School of Engineering and Physical Sciences includes the depariments of:
Earth and Environmental Sciences
Engineering
Physics
The College of Arts and Sciences includes the following departments:
Aerospace Studies
Art
Biviogy
Chemistry
Education
History and Political Science
Language and Literature
Mathematics and Computer Science

## dministrative Offices

Dision of Graduate Studies
and Continuing Education Offices
Music
Nursing
Physical Education and Hygiene Psychology Sociology and Anthropology Speech, Communications and Theater Arts

Second Floor, Max Roth Center
215 South Franklin Street
Wilkes-Barre, PA 18766
x.Mahmoud H. Fahmy, Dean
raduate Studies Secretary, 824-4651, extension 226
intinuing Education Secretary, 824-4651, extension 225
Dilfree from Scranton, Pennsylvania 342-5617
omelsewhere in Pennsylvania (800) 572-4444
fom Middle-Atlantic and New England Regions (800) 537-4444
rance Office
hancial Aid Office
ternational Students Advisor

Part-ime Undergraduate Offices

Registar's Office
ecorder's Office

First Floor, Sturdevant Hall 129 South Franklin Street
Second Floor, Sturdevant Hall 129 South Franklin Street
Second Floor, Chase Hall 184 Sourth River Street

Second Floor, Chase Hall 184 South River Street

First Floor, Sturdevant Hall 129 South Franklin Street
Second Floor, Sturdevant Hall 129 South Franklin Street

FALL SEMESTER - 1987
Registration Monday, August 3

Graduate registration begins for the Fall Semester Wednesday, Augustended registration
Thursday, August 27
Classes begin
Wednesday, September 2
Fall Recess
Friday, October 16
to Wednesday, October 21
Thanksgiving Recess
Tuesday, November 24
to Monday, November 30
8:30 a.m. to 4:30 p.m
8:30 a.m. to 8:00 p.m 8:30 a.m. to 8:00 p.m
asses end
Tuesday, December 15
xaminations
Thursday, December 17, thru Wednesday, December 23

## SPRING SEMESTER - 1988

Registration

## Monday, December 7, 1987

Extended registration
Monday, January 11
Tuesday, January 12
Classes begin
Wednesday, January 20
Wednesday, January 20, 1988 follows Monday Class Schedule)
8:00 a.m.

Last day to file application for assistantships Friday, February 12

Winter Break
Wednesday, February 17
10:00 p.m. 8:00 a.m.

Spring and Easter Break
Friday, March 25
5:00 p.m. 8:00 a.m.

Classes end Friday, May 6

10:00 p.m.
Examinations
Monday, May 9 thru Saturday, May 14

Commencement Sunday, May 22, 1988

8:30 a.m
4:30 p.m.

11:00 a.m.

SUMMER 1988
First Day Session
Registration
Wednesday, June 8
Thursday, June 9
Classes begin
Monday, June 13
Classes end
Friday, July 15
(Including Final Examinations)
Eight-Week Evening Session
Registration
Wednesday, June 8
Thursday, June 9
Classes begin
Monday, June 13
Classes end
Friday, August 5
(Including Final Examinations)
Second Day Session
Registration
Wednesday, July 13
Thursday, July 14
8:30 a.m. to 6:00 p.m. 8:30 a.m. to 6:00 p.m.
Classes begin
Monday, July 18
Classes end
Friday, August 19
(Including Final Examinations)

8:30 a.m. to 8:00 p.m. 8:30 a.m. to 8:00 p.m.

8:30 a.m. to 8:00 p.m. 8:30 a.m. to 8:00 p.m.

APPLICATION
Applicants interested in graduate programs offered at Wilkes College should apply to the Division of Graduate Studies and Continuing Educafion. 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 felds.
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 pro-
gram 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.
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 College. 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 or College 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.
Spécific departmental requirements established for each area of study are to be found herein. Each applicant should consult these requirements 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 College's resources to provide outstanding graduate programs.

## CLASSIFICATION OF STUDENTS

A graduate student may be admitted either as a degree student or spe cial non-degree, depending upon the student's objectives. After admission to one of these categories, any change to the other must be ar ranged through the Dean of the Division of Graduate Studies and Continuing Education.
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
Provisional admission is a temporary classification in which an applicant may remain until completion of 12 graduate credits and/or undergraduate prerequisites, if any. The Dean of Graduate Studies and the appropriate School or College will review provisional admissions annually in order to revaluate their status in the graduate program. A student accepted as a provisional student because of marginal undergraduate grades will be permitted to take a maximum of 12 credits as a provisional student.
Students will be assigned academic advisors immediately upon their acceptance into a graduate program.
Undergraduate students at Wilkes College may be permitted to enroll in certain graduate courses with the approval of the Deans of the Schools or College and the Dean of Graduate Studies. Credit for such courses wil ordinarily 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.

## 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 intiated by the college 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 lobe 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.

## General Academic Information

## 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 or College 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 and College

## 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 student's advisor, the Chairman of the Department and the Dean of the Division of Graduate Studies and Continuing Education. Transferred academic work must have been completed within six years prior to the date of the admission to the Graduate program at Wilkes College, must be at least B quality, and must appear on a graduate transcript. Pass-Fail grades are not transferable to an ad vanced degree program unless the "Pass" can be substantiated by the ormer institution as having at least "B" quality. 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 Dean of Graduate Studies. Forms for transfer of credit may be obtained at the office of Graduate Studies, Max Roth Center, second floor, 215 South Franklin Street.

## GRADE REGULATIONS

Numerical grades are given for graduate work:
$4=A-$ Academic achievement of outstanding quality
$3=B-$ Academic achievement of acceptable quality in meeting requirements for graduation.
$2=C$ - Academic achievement of quality below the average required for graduation
$0=F-$ Academic achievement below the minimum required for 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 recommended by the Instructor and be granted only by the Dean of Graduate Studies.
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 College.
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 and College, the Chairperson of the appropriate department in accordGraduate 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 Graduate Office and have it approved by the instructor, the faculty advisor and the Dean of Graduate Studies. Failure to secure authorized withdrawal for a course not completed will result in a grade of 0 .

REGULATIONS ON THESIS RESEARCH
Each graduate student shall select a major advisor under whose direc. tion he wishes to pursue his thesis research, if a thesis is required. Follow. ing 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 College. 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 progjunct professor of the College and shall supervise the day-to-day progress of the student's research.

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 Of. fice 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
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 such examination is $\$ 20$ per credit.

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 college seal and are not official. The seal is attached only when the transcript is mailed directly from the College to another college or authorized agency. A transcript of work completed at any college or high school must be requested by the student to be sent directly from that institution to Wilkes Colege Graduate Office.
There is no charge for the first transcript requested. The student will pay two dollars for each additional transcript.

DISCIPLINARY PROCEDURES
Graduate students are obligated to observe the regulations governing all students of the College relative to:
. 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 College community.

Any disciplinary cases arising from a lack of observance of these regulations will be adjudicated by the Dean of the Graduate School and the Dean of Student Affairs. These two Deans shall have the responsibility of hearing such cases with the Chairman 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.

## FEES AND EXPENSES

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 Finance Office, Sturdevant Hall. Several plans have been devel oped to assist students who do not have the cash in hand, and it is sug gested 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 college upon completion of registration by the student.

Application Fee: \$25.
Tuition Cost per Semester: \$195 per credit hour.
College Fee: \$3 per credit hour.
Graduation Fee: \$65 (Charged to all graduating students in their last semester.)
Thesis Binding Fee: $\$ 7$ 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 Finance 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 bal. ances personally before clearance forms are signed or have a written guarantee from their employer that the amount will be paid to Wilkes College 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 Finance Office. These forms must be submitted each semester.

## ASSISTANTSHIPS AND COUNSELORSHIPS

The College awards a limited number of Graduate Assistantships. Applications for these assistantships must be filed with the Dean of Graduate Studies no later than February 12, 1988 for the 1988-89 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.

## REFUNDS

Students who have paid their tuition in full and who withdraw from courses or from the College 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
Academic Year:

5-week Summer Sessions: 8-week Summer Session:

First two weeks
Third and fourth week
Fifth week
After fifth week
First week
First two weeks

Tuition refund
80\%
60\% 40\%
No refund
50\%
50\%

## GRADUATION

All graduate students are expected to participate in commencement exercises at the close of the academic year in which they complete their degree requirements. It is the responsibility of the graduate student to inform the Graduate Office in written form of his/her impending graduation no later than February 15 of the year in which he/she expects to receive the degree.

## College of Arts and Sciences

James P. Rodechko, (Ph.D.) Dean

## Biology

Lester J. Turoczi, (Ph.D.) Chairman

## Master of Science in Education

Candidates for the degree of Master of Science in Education with a major in biology must take eighteen hours of biology in courses numbered 301 or above. Chemistry 361 and 362 may be taken for credit toward the biology component with the prior approval of the Chairman 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 21.

## COURSES OF INSTRUCTION

BIOLOGY 303. BACTERIOLOGY
Three 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: $\$ 35$. ulturing of bacteria. Fee: $\$ 35$
Prerequisite: Biology 121-122, 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 natura history, evolution, and classification of these forms. Lecture, two hours a week; laboratory
Prerequisite: Biology 121-122, or permission of instructor:

## BIOLOGY 305. INVERTEBRATE BIOLOGY

Three credits
A study of the major invertebrate phyla with respect to their taxonomy, evolution, morphology, physiology and ecology. Fee: \$35.
Prerequisite: Biology 121-122, or permission of instructor

## BIOLOGY 307. ANALYTICAL CYTOLOGY

Three credits
Experimental analysis of cell structure, organelles, chemistry and activities by means of microscopic techniques and instrumentation. Fee: $\$ 35$.
Prerequisite: Biology 121-122, or permission of instructo

## BIOLOGY 308. GENETICS

Three credits
This course will present a detailed treatment beyond the introductory level with particular
emphasis on populational emphasis on populational aspects of heredity. Topics will include plant and human genetics. Lecture, two hours a week; laboratory, three hours a week. Fee: $\$ 35$.
Prerequisite: Biology 121-122, or permission of instructor.

## BIOLOGY 309. EVOLUTION

Three credits
Evolution is a study of how new species of organisms are derived from previously credits species. Emphasis is placed upon the processes of organic evolution and the develop Prerequiste the evolionary ideas. Fee: $\$ 15$
Prerequisite: Biology 121-122, or permission of instructor.

BIOLOGY 310. ANIMAL BEHAVIOR
Three credits
Acourse 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: $\$ 35$
Prerequisite: Biology 121-122, or permission of instructor.
BIOLOGY 312. COMPARATIVE PHYSIOLOGY
Three 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, two hours a week; laboratory, three hours a week. Fee: $\$ 35$
Prerequisite: Biology 121-122, or permission of instructor.
BIOLOGY 313. PARASITOLOGY
Three credits
Parasitology is the study of organisms that live on or within other organisms and the relaParasitology is the study of organisms that live on or within other organisms and the rela-
fionship of these organisms to their hosts. This course deals with the common parasites tonship of these organisms to their hosts. This course deals with lare comm, three hours a
that infect man and other animals. Lecture, two hours a week; laboratory, the week. Fee: $\$ 35$.
Prerequisite: Biology 121-122, or permission of instructor.
BIOLOGY 315. MOLECULAR BIOLOGY
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 proleins, carbohydrates, and lipids with extensive coverage of molecular genetics. Lecture, three hours a week.
Prerequisite: Biology 121-122, Chemistry 231-232, or permission of instructor.

## BIOLOGY 317. ECOLOGY

Ecology examines contemporary ecological thinking as it pertains to the inerrelationship of organisms and their environments. Interactions at the population and community levelsare emphasized. Lecture, two hours a week; laboratory, three hours a week. Fee: $\$ 35$. Prerequisite: Biology 121-122, or permission of instructor.
BIOLOGY 318. DEVELOPMENTAL BIOLOGY
Three credits
A course dealing with principles of organismic development, gametogenesis, fertilizaton, cleavage, embryogenesis, differentiation, morphogenesis, regeneration. Laboralory work includes vertebrate embryology, microtechnique, and some experimentation. three hour awe Laboratory fee: \$35.
Prerequisite: Biology 121-122, 223-224, or permission of instructor.
BIOLOGY 319. PLANT DIVERSITY
Three credits
A comprehensive survey of bryophytes, vascular plants and plantlike organisms (fungi and algae) emphasizing their structure, reproductive biology, natural history, evolution, and algae) emphasizing their structure, reproductive biology, natural history, evolution, week. Laboratory fee: $\$ 35$.
Prerequisite: Biology 121-122, 223-224, or permission of instructor.
BIOLOGY 320. PLANT FORM AND FUNCTION
Three 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
Prerequisite: Biology 121-122, 223-224, or permission of instructor.

BIOLOGY 340. LIMNOLOGY
Three credits
A study of the chemical, physical, and biological aspects of fresh water systems. Labor tory investigations will consist of in-depth analyses of local lakes and streams. Lecture two hours a week; laboratory, three hours a week. Fee: \$35
Prerequisite: Biology 121-122, or permission of instructor.
BIOLOGY 341. IMMUNOLOGY AND IMMUNOCHEMISTRY
Three 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 se of hypersensitivity, phenomena inmunization, and related patho-physiologic alterations or hypersensitivity, phenomena in vertebrate animals and man. A background in microb istry is advisible. Lecture, two hours a week; laborator Prerequisite Bi. Fee. \$35.

BIOLOGY 385. FIELD BOTAN
Three credits
This is a specialized summertime field course which emphasizes a taxonomic, phyloge netic, 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
hose upperclassmen wishing to register for the course
Prerequisite: Biology 121-122, 223-224, 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 esults. One hour of lecture per week, plus field trip. Fee: Variable.
Prerequisite: Biology 121-122, or permission of instructor.

## BIOLOGY 398. TOPICS

Three credits
study of topics of special interest not extensively treated in regularly offered courses. Prerequisite: Biology 121-122, or permission of instructor.

## Chemistry

Howard A. Swain, Jr., (Ph.D.) Chairman

## Master of Science in Education

## ADMISSION

For admission to graduate study in chemistry education, 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 major in chemistry are listed under Education on page 21. Specific chemistry requirements will be outlined by the student's advisor in the
chemistry department.

## COURSES OF INSTRUCTION

## CHEMISTRY 325. ADVANCED INORGANIC CHEMISTR <br> Three credits

Introduction to ligand and field theory; chemistry of the first transition series, 'organometal. ic. and pi-acceptor compounds: mechanisms of inorganic reactions. Prerequisite: Chemistry 222 and 252

## CHEMISTRY 335. ADVANCED ORGANIC CHEMISTRY

Three credits An intensive treatment of the concepts of physical organic chemistry with emphasis on the mechanisms of homogeneous organic reactions and the physiochemical methods or determining the structure of organic molecules
Prerequisite: Chemistry 232
CHEMISTRY 344. ADVANCED ANALYTICAL CHEMISTRY spectrophotometric, electro-analytical, and chromatographic. Theory and practice of analysis of more complex materials. Class, two hours a week; laboratory, six hours a week. Fee $\$ 45$.
Prerequisite: Chemistry 252
CHEMISTRY 356. ADVANCED PHYSICAL CHEMISTRY Three credits Adetailed examination of statistical thermodynamics, advanced kinetics, quantum theory, and spectroscopy.
Prerequisite: Chemistry 252
CHEMISTRY 361. BIOCHEMISTRY I
Three credits
Astudy 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 Astudy 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

## Education

Joseph T. Bellucci, (Ed.D.) Chairman
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 flexbility is provided, however, to permit others interested in education.to arrange programs of study appropriate to their interests.
Programs are offered in General; Elementary; and Field Education; Educational Computing; Secondary Education; with a major in Biology, Chemistry, English, History, Mathematics, or Physics; and Special Education.

Wilkes College has been designated as a Regional Computer Resource Center. This center was established in 1984 as part of the Informafion 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 serv. ices:

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 ona 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 acr demic 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 or the equivalent with an appropriate major.
Students deficient in any phase of requirements may, at the discretion of the academic department, the Education Department, or the Dean of Graduate Programs, 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 "spe cial non-degree" admission status.

## DEGREE REQUIREMENTS

All candidates for the Master of Science in Education degree must complete a program of thirty credits; at least 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 who majors Education must earn nine credits in one Area in education, beyond the twelve-credit basic requirement, and must (a) take Education 526 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 the Master of Science in Education degree who majors 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 who majors in one of the secondary school teaching subjects must complete eghteen credits in the appropriate academic department; three of the twelve credits in education must be in Area IV.
A candidate for a Master of Science in Education with a concentration in Educational Computing must complete thirty credits; six credits must bein Areal, and Education 522, 581,582, 583,585,587, 588, and 589.
A candidate for the Master of Science in Education who is a practicing leacher may elect the degree with Field Education concentration. The requirements for this degree are: Two courses in Area I; one course in Area II, Ed 520 or 521; 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 Teaching Strategies; and six elective credits in education.
A candidate for the Master of Science in Education degree with concentration in Special Education must take Education 525,560, 561, 562, 564, and Psychology 331.
Certification courses in Area 0 are not accepted for degree requirement credit. Transcripts will show credit for these courses for certification purposes only.

## 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 aco-advisor in the Education Department.

## COURSES OF INSTRUCTION

EDUCATION
AREA 0 - CERTIFICATION COURSES

## EDUCATION 400

GENERAL SECONDARY SCHOOL METHODS
Three credits
An introduction to principles, methods, and materials appropriate for secondary school instruction.

EDUCATION 401-402
ELEMENTARY CLASSROOM METHODS
An introduction to principles, methods, and materia instruction. Education 401 is a prerequisite to 402 ile

EDUCATION 403-404. INTERN TEACHING
Three credits each semester Beginning teachers are assigned to supervisors who work with them to facilitate their introduction to classroom teaching.
Section A Elementary
Section B Secondary

## EDUCATION 405.

INTRODUCTION TO READING INSTRUCTION
Three credits
A foundation course in reading instruction.

## EDUCATION 409. SHORT COURSES

These courses treat a variety of topics, usually on a condensed schedule basis. They are designed to meet the immediate needs of teachers and may not be used to satisfy degree requirements. Credit is given at the rate of one-half semester hour for each eight hours of classwork.

## 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 probem 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, so cial 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 develope 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.
EDUCATION 515.
EDUCATION PLANNING IN DEVELOPING NATIONS
Three credits
An analytical study of educational patterns in developing nations. Educational systems are described, analyzed and compared with particular attention to planning and system analysis.

## AREA II - PROFESSIONAL SKILLS IN EDUCATION

## EDUCATION 520. TESTS AND MEASUREMENTS <br> 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. This course may not be taken for credit subsequent to Education 526.
Prerequisite: Education 520 or equivalent
EDUCATION 526. EDUCATIONAL RESEARCH II
Three credits
Advanced study of research methods; literature search leading to a thesis proposal Prerequisite: Education 521 or equivalent.

## AREA III - ELEMENTARY EDUCATION

Education 531. CHILDREN'S LITERATURE
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
D Social Studies
B Science
C Language Arts
E Special Subjects

EDUCATION 534. ELEMENTARY SCHOOL CURRICULUM Three credits Astudy of curricula offered in elementary schools, grade placement of content, articulaion of subject matter areas, development of specialized programs
Prerequisite: Fifteen graduate credits.
EDUCATION 535. NONGRADED INSTRUCTION
IN THE ELEMENTARY SCHOOL

Prerequisite: Permission of the instructor.

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 - SECONDARY EDUCATION

## EDUCATION 540. SPECIAL METHODS IN

 SECONDARY SCHOOL INSTRUCTION$\qquad$
B Chemistry
C Environmental Science
D English
E History
Three credits each semester
F Mathematics
G Physics
H Reading
I Social Sciences
J Educational Theater
K Science
EDUCATION 541. SECONDARY SCHOOL CURRICULUM
Three credits A study of secondary school curricula, traditional programs, recent developments, provisions for innovation and individualization

EDUCATION 542. EXTRA-CURRICULAR ACTIVITIES
Three credits
A study of the development of extra-curricular activities, organization and administration, the role of the sponsor, recent trends.

## AREA V - FIELD EDUCATION

The following courses were developed by educators at Performance Learning Sys tems, Inc. The coursework is tightly structured, utilizing programmed learning with inte grated audio-visual materials. Students conduct research in their own classrooms and report regularly on their success in employing strategies taught. Instructors for these
courses receive special training prior to assignment.

EDUCATION 550. PROJECT T.E.A.C.H.
Three credits
Teacher Effectiveness and Classroom Handling (T.E.A.C.H.) deals with clarity of communication, avoidance of confrontation, and techniques to reduce tension in the classroom.
EDUCATION 551. P.R.I.D.E.
Three credits
Professional Refinements in Developing Effectiveness (P.R.I.D.E.) treats questioning techniques, non-verbal communication, and the development of contracts to motivat

EDUCATION 552. TEACHING THROUGH LEARNING CHANNELS Three credits This course utilizes recent brain research, examines individual differences in learning styles, and develops adaptive teaching procedures to accommodate varying cognitive processes

EDUCATION 553. TEACHING STRATEGIES
Three credits Teaching Strategies is designed to explain ways inductive, deductive, analysis and synthesis processes can be taught in classroom lesson. This includes effort management and curriculum decision making

## AREA VI - SPECIAL EDUCATION

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
B - Socially and Emotion
EDUCATION 561. INDIVIDUAL ASSESSMENT
Three credits
Advanced study of instruments utilized in the measurement of personality and intelligence.
Prerequisite: A course in testing
EDUCATION 562.
REMEDIATION OF LEARNING DISABILITIES
Astudy of the major areas of learning disability: gross motor development, sensory-motor development, perceptual-motor skills.
EDUCATION 563.
REMEDIATION OF LEARNING DISABILITIES II Three credits
Acontinuation of Education 562: language development, conceptual skills, social skills. Prerequisite: Education 562
EDUCATION 564.
CURRICULUM AND METHODS IN SPECIAL EDUCATION Three credits
Advanced study of instructional materials and techniques employed in special education programs.

## AREA VII - SUPERVISION

## EDUCATION 570. SUPERVISION OF INSTRUCTION

Three credits
Astudy of the responsibilities supervisors have and proven techniques by which these duties are carried out.
EDUCATION 571. PRACTICUM IN SUPERVISION
Six credits
Affords students an opportunity to gain experience in supervisory activities in education under the guidance of experienced supervisors.

EDUCATION 573. CURRICULUM CONSTRUCTION Advanced study of curriculum development and evaluation.
EDUCATION 575. GROUP DYNAMICS
Three credits
Study of the nature and behavior of groups.

EDUCATION 578. SCHOOL LAW
Three credits An examination of school law at the federal state and local levels; review, discussion and ant
EDUCATION 579. NEGOTIATIONS IN EDUCATION
Three credits
A study of the processes and strategies used in collective negotiations in education, simu lation of the bargaining confrontations, interaction analysis of the simulation.

## AREA VIII - 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 mod eling, graphics and simulation. Emphasis is on the application in instructional environ ments.
Prerequisite: Prior computer experience.
EDUCATION 582. INSTRUCTIONAL PROGRAMMING IN PASCAL Three credits PASCAL for microcomputers. Emphasis will be on the use of this structured program ming for classroom instruction and the preparation for teaching the AP course in comput ing.

## EDUCATION 583. MACHINE LANGUAGE Three credits

Basic principles of machine language programming. Computer organization and repre sentation of numbers, strings, arrays, list structures at the machine level
Prerequisite: One course in a high-level language

## EDUCATION 584. LOGO

Three credits
Itroduction to computer programming using the LOGO language. Topics included are urtle graphics; writing procedures that use numbers, words and lists; LOGO syntax; us ing re
tures.
EDUCATION 585. MICROCOMPUTER-ASSISTED INSTRUCTION Three credit Design, development and testing of microcomputer-assisted instructional units as tuto rial, simulation, and drill, using the PILOT language.
Prerequisite: One course in a high-level language.

## EDUCATION 586. MICROCOMPUTERS IN EDUCATION <br> Three credits

An analysis of microcomputer applications designed for use in various educationa settings. Special emphasis is placed on software evaluation
Section A Mathematics
B Science
Social Studie
E Special Topic
C Language Arts

EDUCATION 587. MICROCOMPUTER DATA STRUCTURES
Three credits
THe use of a high-level language to implement complex data structures. These include ists, trees, graphs, networks and storage allocation.
Prerequisite: One course in a high-level language.

DUCATION 588. MICROCOMPUTER ORGANIZATION
AND OPERATING SYSTEMS
Three credits
he study of architecture and design of present day microcomputer systems. Common The study of architecture and design of present day microcomputer systems. Comn Prerequisite: Ed 587.

EDUCATION 589. METHODS OF TEACHING COMPUTER SCIENCE
study of instructional methodology in computer science. Attention is given to character stic problems faced by teachers.

## AREA IX - ADVANCED GENERAL COURSES

EDUCATION 590. THESIS EDUCATION 594. WORKSHOP

Three credits Three credits each semester
fovides an opportunity for experienced teachers to develop study programs designe 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 semeste Alords an opportunity for independent study of selected topics under faculty supervi son.
Prerequisite: Permission of department chairman
EDUCATION 597. SEMINAR Three credits
n advanced course dealing with some significant issues selected by the instructor. The eminar technique provides a review of major problems based on the current level of nowledge in the area.
Prerequisite: Permission of the instructor.
EDUCATION 598. TOPICS Three credits dvanced 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 These courses treat a variety of topics, usually on a condensed schedule basis. Designed oinvestigate 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-ha semester hour for each eight hours of classwork

## English

Walter Karpinich, (Ph.D.) Chairman

## Master of Science in Education

SPECIAL DEGREE REQUIREMENTS
Candidates for the degree of Master of Science in Education with a major in English must complete eighteen hours of course work in Eng lish, twelve of which must be in courses numbered 400 or above.

Information on requirements of the Education Department for the Mas ter of Science Degree will be found under Education on page 21.

## 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 and the drama.
ENGLISH 312. CHAUCER
Three credits
Study of Chaucer's life and major works, including The Canterbury Tales and Troilus and Criseyde.

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\text { Prerequisite: Eng } 152 \text { or } 254 .
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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 John. son.
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 <br> 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

ENGLISH 370. MODERN BRITISH POETRY
Study of the major English and American poetry of the twentieth century ENGLISH 372. MODERN NOVEL

Three credits

Three credits Sudy of the major English and American novels of the twentieth century.
ENGLISH 374. MODERN DRAMA Three credits
Sudy 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
Astudy 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 drection of a staff member. A research paper at a level significantly beyond a term paper is required.Prerequisite: Approval of department chairman.
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 <br> Astudy of special topics in English and American literature.

Three credits
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 inliterary rear student with the resources and procedures used in literary research.
ENGLISH 405. STUDIES IN LINGUISTICS
Three credits
A sudy of generative transformational grammar as developed by Chomsky, Lees and A study of generative transformational grammar as developed by
others resulting from work done by Harris and other structuralists.

ENGLISH 410. STUDIES IN MEDIEVAL LITERATURE
Three credits

ENGLISH 420. STUDIES IN RENAISSANCE LITERATURE
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 maior English prose and peetry ofthe Three credits
ENGLISH 470. STUDIES IN MODERN BRITISH LITERATURE
A study of selected major British authors of the twentieth century. tury.

ENGLISH 480. STUDIES IN AMERICAN LITERATURE
hree credits

Three credits 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.) Chairman

## Master of Science in Education

## SPECIAL DEGREE REQUIREMENTS

Candidates for the degree of Master of Science in Education with a major in 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 Mas ter of Science in Education, major in history, will be found under Educa tion on page 21

## COURSES OF INSTRUCTION

## HISTORY 315. ANCIENT HISTORY: NEAR EAST

Three credits
The birth of civilization in Mesopotamia and Egypt. Babylonian, Persian and Judaic back grounds of western civilization. Attention will also be paid to certain lesser civilizations with emphasis on the role of archeology

## HISTORY 316. ANCIENT HISTORY: CLASSICAL WORLD <br> Three credits

The direct Greco-Roman antecedents for western civilization will be developed, begin ning with Mycenae, through Homer, the Golden Age, Hellenistic world, and the rise and all of Rome. Emphasis will be on the cultural contributions of each group and period to our present world.
HISTORY 321. AMERICAN SOCIAL HISTORY
Three credits
This course entails a consideration of the development of American society from the coloial 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

HISTORY 322. AMERICAN INTELLECTUAL HISTORY the late 19th and early 20th centuries because this period is the time when seminal ideas vere articulated in America
HISTORY 324. AMERICAN ECONOMIC HISTORY
Three credits
Asurvey of the evolution of the American economy from colonial dependency to modern Adustrial maturity. Emphasis will be placed upon the development of the United States as an industrial world power since about 1850 .
HISTORY 325. AMERICAN ETHNIC HISTORY and Indian communities from colonial times to the present.
HISTORY 326. URBAN HISTORY
Three credits
survey of the origins and development of the modern city. Primary emphasis is givent the evolution of the city in America and its influence on American society and culture eference is made to the cities of modern Europe and Asia primarily for comparative pu poses.

HISTORY 328. HISTORY OF THE
FOREIGN POLICY OF THE UNITED STATES
Three credits
Aselective treatment of major themes in American foreign policy from the founding of the Republic to the present.
HISTORY 331. COLONIAL AMERICA
Three credits
Discovery, exploration and settlement; development of social, political, religious and intel ectual institutions; independence and political reorganization
HISTORY 332. THE NATIONAL PERIOD
Three credits
Astudy of the political and economic history of the United States from 1783 to 1865 . Spe cial attention will be given to the evolution of sectional differences and the culmination of these differences in intersectional warfare.

HISTORY 333. THE AGE OF BIG BUSINESS, 1865-1914 cal attention will be paid to the period of congressional dominance and the restoration of residential power at the turn of the century; the economic, social and political conse quences of the industrial revolution; and the rise or urban America.
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.

HISTORY 341-342. HISTORY OF GREAT BRITAIN AND THE bRITISH EMPIRE AND COMMONWEALTH

Three credits each semeste A study of British history from the Neolithic period to present times. The first semester wil cover social, economic, and political developments to 1783, including expansion over seas. 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. MEDIEVAL EUROPE

Consideration will be given to political, economic, and cultural institut Three credits and intellectual development in Medieval Europe to the early Renaissance and activities

## HISTORY 352. THE RENAISSANCE AND REFORMATION

Three credits
Within the political and economic framework of the period, study will be made of the culsixteenth century.

HISTORY 353. AGE OF ABSOLUTISM
Three credits
The political, social, economic, intellectual, and cultural development of Europe and de loca. 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

Against a background of the internal and international developments of the leading
powers, the class will study 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 em phasis on their interrelations and distinctive characteristics and on their transformation in response to the penetration of western civilization from the sixteenth century onward of Southeast Asia. Fall semester: to c. 1760. Spring semester: 1760 to pong the countries (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, eco
nomic, 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 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 .

Three credits
HISTORY 376. WORLD WAR II
Consideration of the causes of the war, military strategy and tactics, diplomatic interests of
the participants, and resulting cold war problems.

HISTORY 382. HISTORY OF LATIN AMERICA
Three credits
This course is a survey of the development of Latin American political, cultural, and economic life, from ancient times, through the Iberic colonization and period of independence, to the tumultuous era of the mid and late 20th century

ISTORY 391. HISTORIOGRAPHY AND RESEARCH
Three credits
An introduction to historical research and writing. The writings and ideas of major histoians 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 sequired.

HISTORY 398. TOPICS
Three credits
Secial 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
resentations and discussions of selected topics. (May be repeated for credit.)
Prerequisite: Approval of the instructor is required.

## Political Science

Joel Berlatsky, (Ph.D.) Chairman

## COURSES OF INSTRUCTION

PS 301. POLITICAL DYNAMICS
Three credits
Astudy of the various modes of citizen political participation in the United States. The role A study of the various modes of citizen political participation in the United States. The role xamined and evaluated. Case studies will be introduced throughout
Prerequisite: PS 102.
Offered in alternate years
PS 307. THE AMERICAN PRESIDENCY
Anexploration and analysis of the development and changing role of the American Pres dent 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 problems.
Prerequisite: PS 102
Offered in alternate years

PS 316. GOVERNMENT BUDGETING
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 instructo
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 instructo
Offered in alternate years.

## PS 323. DEMOCRATIC SYSTEMS

Three credits
systems in the modern world and, 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 tion to Communism in Eastern Europer and other countries of the world. Some atten
on to Communism in Eastern Europe, and the Third World
Prerequisite: PS 105 or consent of instructor
Offered in alternate years

## S 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
ption under History
PS 329. INTERNATIONAL LAW AND ORGANIZATION
A study of the nature, application, and sources of public international law and how it re ates to the evolution of global and regional organizations and alliances, including interna onal non-governmental organizations and other non-state actors.
Prerequisite: PS 202 or consent of instructor

## Offered in alternate years

## S 331. CONSTITUTIONAL LAW I

Three credits
Study of the 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 the relations between the states and the Federal Govern ment.

Prequisite: 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 Su preme Court. Analysis of the landmark decisions regarding free speech and press, sepa ation 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
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.
OHfered 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 influencesPrerequisite: PS 102 or consent of instructor.
Offered in alternate years.

## PS 354. ADMINISTRATIVE LAW AND POLICY

Analysis of the ways in which public policy is made and effected in administrative agen cies, of the ways in which the public administrator operates and the linkage between ad ministrative 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 deparment 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 re quired.
Prerequisite: Approval of department.
Offered every semester.

## PS 397. SEMINAR

Three credits
Presentations and discussions of selected topics by students.

## PS 198/298/398. TOPICS IN POLITICAL SCIENCE/

 TOPICS IN POLICY ANALYSISVariable 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 politica 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. topics course in a specific field of public policy, such as Energy, Environmental Science ental Health and Retardation, etc., will be offered also.
Prerequisite: Permission of department, criterion depending on topic.

Mathematics
Richard E. Sours, (Ph.D.) Chairman
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
An applicant should have a baccalaureate degree from an accredited college or university. He is expected to have completed courses in ad vanced 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 334, 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 major in Mathematics:

A minimum of thirty credits of approved courses, to be distrib. uted as follows, is required.

1. Education courses: 12 credits
six credits in Area I
three credits in Area II
three credits in Area IV
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.
MATHEMATICS 314. FUNCTIONS OF A COMPLEX VARIABLE Three credits Complex functions, limit, continuity, analytic functions, power series, contour integration, larent expansion, singularities and residues.
MATHEMATICS 331.
INTRODUCTION TO ABSTRACT ALGEBRA I Three credits
A study of elementary number theory, groups, rings, and fields.
MATHEMATICS 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.
MATHEMATICS 343. INTRODUCTION TO GEOMETRY Three credits A study of selected topics from Euclidean geometry, affine geometry, projective geometry, and convexity.
MATHEMATICS 351-352. PROBABILITY AND MATHEMATICAL STATISTICS I AND II
Random variables, probability distributions, Three credits each testing statistical hypotheses, confidence intervals.
MATHEMATICS 361-362.
INTRODUCTION TO APPLIED MATHEMATICS I \& ॥
INTRODUCTION TO APPLIED MATHEMATICS \& il each semester Mathematics of physical science and engineering. Topics include: vector integral and dif-
ferential calculus, power series, partial differential equations, Fourier analysis, and eigenterential calculus,
value problems.
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.
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 334.
MATHEMATICS 432.
INTRODUCTION TO ABSTRACT ALGEBRA II Three credits
A continuation of Mathematics 331. Polynomial rings, ideals, field extensions and Galois Pry.
Prerequisite: Mth 331.

## MATHEMATICS 470

READINGS IN MATHEMATICS
Three credits per semeste ined matics.
Prerequisite: Consent of department chairman

## MATHEMATICS 511. MEASURE AND INTEGRATION

Three credits
Measures, measurable functions, integration, convergence theorems, product meas ures, signed measures
Prerequisite: Mth 342, or consent of instructor.

## MATHEMATICS 513. FUNCTIONAL ANALYSIS

Three credits
Topics include: Banach spaces, Lp-spaces, Hilbert spaces, topological vector spaces, and Banach algebras
Prerequisite: Mth 311 and 334

## MATHEMATICS 532. MODERN ALGEBR

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. rings.

Prerequisite: Mth 331 and 334 , or consent of instructor.

## MATHEMATICS 542. ALGEBRAIC TOPOLOGY

Three credits
Polyhedra, simplicial homology theory, cohomology rings, and homotopy groups
Prerequisite: Mth 342.

## MATHEMATICS $398 / 498 / 598$. TOPICS IN MATHEMATICS

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 <br> Prerequisite: Consent of department chairman. <br> Three or six credits

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, GPSS, GASP, SIMSCRIPT and/or SLAM
Prerequisite: CS 223, 224, or 225 and one year of calculus.

## CS 323. FORMAL LANGUAGES AND AUTOMATA THEORY

Three credits This course formalizes many topics encountered in previous computing courses. Topics inluce: languages, grammars, finite automata, regular expressions and grammars, con-lext-free languages, push-down automata, Turing machines and computability,
Prerequisite: Mth 202 and CS 225.

## CS 327. COMPILER DESIGN

Prerequisite: CS 227 and 323

## CS 328. ANALYSIS OF ALGORITHMS <br> Three credits

Theoretical analysis of various algorithms. Topics are chosen from sorting, searching, se lection, matrix multiplication and multiplication of real numbers, and various combina tional algorithms.
Prerequisite: CS 227.
CS 367. COMPUTER GRAPHICS
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.
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 chairman.
All requirements for both degrees must be met. In addition, Mth 511 and 532 are required. No credit shall be counted in both degree pro grams. Scheduling will be done so that the student will be eligible to receive a B.S. degree at the end of four years.

## School of Business and Economics <br> Theodore J. Engel, (MBA, M.A.) Dean

## Program Coordinators

Accounting
Business Administration
Economics
MBA
Kenneth A. Broadt (M.S., C.P.A.)
Theodore J. Engel (MBA, M.A.)
Welton Farrar (M.S.)
Wagiha Taylor (Ph.D.)

## Programs

## Master of Business Administration

The curriculum leading to the Master of Business Administration De gree provides an opportunity for specialization in a selected field but is concerned mainly with advanced study of broad managerial concept and relationships. The purposes are:

1. to develop professional managers, with emphasis on the founda tion, 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.

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 Programming | 1 semester |

If a student has not taken one of the above courses but believes that he possesses the information normally taught in that course, 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 $\mathrm{D}+$ in any of the background 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 credits of graduate work in 500-level courses. Fifteen of these thirty credits must be in core courses. All candidates mus complete Accounting 503 or an advanced Accounting course; Business Administration 502; Business Administration 507; Economics 505; and Economics 510. (Students with a minimum preparation in Accounting are urged to take Accounting 503; students with twelve or more credits earned in Accounting will not be admitted to Accounting 503, but must substitute Accounting 542, 543, 544, 545 or 546.) The other fifteen of the thirty 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 semester. The fee for the examination is $\$ 10$. The comprehensive exam registration form is available at the Graduate Office. Students are required to fill out this form.
Students who are registered for or plan to complete their final graduate course work for the Degree of Master of Business Administration during the autumn semester may take this examination the preceding spring. A student who fails the comprehensive examination may retake it only once.

## Business Administration

## COURSES OF INSTRUCTION

## CORE COURSES ( 15 semester hours required)

ACC 503. FINANCIAL AND MANAGERIAL ACCOUNTING
Three credits
A basic understanding of both internal and external accounting principles and tech niques with appropriate application to decision models. Financial and managerial ac the concepts and issues are considered from the viewpoint of the report user

2 semesters of Accounting Principles,
1 semester of Managerial Finance
Students with 12 credit hours or more of accounting must fulfill the accounting core re quirement by taking one of the following: Acc 542, Acc 543, Acc 544, Acc 545 or Ac 546. (No topics or independent research.)

## BUSINESS ADMINISTRATION 502. MANAGEMENT SCIENCE Three credits

 As an introductory survey of quanitative decision-making techniques and appropriate applications from the perspective of the user-client. Emphasis is upon the construction at optimization and decision models and the development of efficient solution algorithms. Undergraduate Requirements: Computer ScienceBUSINESS 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 adminis raised as to the kind economic and non-economic factors are involved. Questions are have to the goals of our society, to the and the extent of responsibility business manager hey employ, and to governmety, to the communities in which they operate, to the people icies, as well as to the stockholders of their own
Undergraduate Requirements: Business Law
ECONOMICS 505. MANAGERIAL STATISTICS
Three credits
cal techniques
Undergraduate Requirements: Statistic

## ECONOMICS 510. MANAGERIAL ECONOMIC

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 COMMERCEThree 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 manageforeign credits, technical procedures and documentation.

BUSINESS ADMINISTRATION 512 PRICE POLICY AND PROCEDURE

## Three credit

This course describes the basic pricing process, relates it to pricing decisions, and at templs to provide a systematic pricing program for managers to follow. Topics covere will include internal and external factors in pricing decisions, pricing models in variou kinds of market structure, the special problems of manufacturers and distributors, as we as the management of resources used in the production process and hiring decisions.
BUSINESS ADMINISTRATION 513.
HUMAN BEHAVIOR AND THE MARKETING PROCESS
Three credits
This course deals with the behavior of man in social groupings and as an individual entity. Processes such as learning, perception, motives, personality, and intelligence will be studied particularly as they relate to marketing problems and procedures.
BUSINESS ADMINISTRATION 514.
MARKET RESEARCH AND EXPERIMENTATION
Three credits
This course deals with the experimental techniques that can be applied to the planning execution, and analysis of marketing problems. Modern concepts of statistical decision execution, and analysis of marketing proble
theory and survey techniques are included.
BUSINESS ADMINISTRATION 515
MARKETING MANAGEMENT SEMINAR
Three credits
This seminar deals with the planning, organizing, directing, and controlling of resource utiization as it applies to the marketing function. Students share responsibility for asimilat ing and presenting material for discussion
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.

## AREA II - MANAGERIAL SCIENCE

## BUSINESS ADMINISTRATION 521

ORGANIZATIONAL THEORY
Three credits
This course utilizes the "case analysis" approach in dealing with the theories of organiza tional structures as they apply to planning utilization of resources, employee motivation and strategy development

BUSINESS ADMINISTRATION 522
QUANTITATIVE ASPECTS OF MANAGEMENT
Three credits
This course examines the quantitative aspects of management. It analyzes the optimiza fion of management decisions in the operation of the firm.
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 semina discussions

BUSINESS ADMINISTRATION 524
MANAGEMENT SEMINAR
Thisseminarhas a research orientation. Research, objectives, techniques and methodol ogy will be dealt with

BUSINESS ADMINISTRATION 525. HUMAN RESOURCE MANAGEMENT

Three credits
ager in of the activities and decision-making functions of the ager, incluaing manpower planning, employee rights, EEOC dealings, training and d 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 be dealt with.

ECONOMICS 531. INDUSTRIAL RELATIONS AND THE LAW
Three credits
An in-depth study of labor legislation, federal, state, and local. Emphasis will be placed on .n.L.R.B. decisions and precedents.

## ECONOMICS 532

WAGE DETERMINATION AND ADMINISTRATION
Three credits
A study of economic and institutional forces determining wages. Wage theories are anayzed. Problems of wage administration will be dealt with
ECONOMICS 533. THE LABOR MARKET
Three credits
Economic and non-economic forces influencing labor supply and demand will be studthe 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 the Financial AccounPrandards 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 tim ing of business transactions and the tax implications in choosing financial alternatives.
ACCOUNTING 563. ACCOUNTING POLICIES AND PRACTICES Three credits A review of generally accepted auditing standards and the theories supporting them. In cludes 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 oper
Prer 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 ot the accountant in management advisory services.
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.
No Prerequisites.

## 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 specula tive and investment-quality instruments. Focus is upon traditional techniques of portfolio management, as well as Modern Portfolio Theory.
BUSINESS ADMINISTRATION 552.

## INANCIAL MANAGEMENT

Three credits
Aninvestigation into the theories and techniques of financial planning and analysis. Work ing capital management and cash budgeting are given special attention. Also empha sized are capital budgeting issues, such ascapital asset acquisition, capital structure con siderations, and the evaluation of financing options.

## 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.

## USINESS ADMINISTRATION 554.

MANAGERIAL FINANCE SEMINAR
Three credits Problems in managerial finance. Special topics

## BUSINESS ADMINISTRATION 557.

PENSION ADMINISTRATION
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 Three credits Avoidance, retention, hazard reduction and transfer for dealing with risk are stressed Avoidance, retention, hazard reduction and transfer for dealing with risk are stressed
throughout. Balance sheet losses, income statement losses and third-party tort liability problems are analyzed with goals of selecting optional solutions.

AREA VI - HEALTH CARE
The Health Care Concentration requires nine credits in Health Care designated courses, distributed as three credits in each of three defined sectors.

Sector I Distribution
HSA 503. Health Economics
HSA 520. Health Care Marketing
HSA 521. Health Care Product Development
Sector II Administration
HSA 501. Leadership and Human Resource Management in Health Care Institutions
HSA 504. Strategic Planning
HSA 540. Labor/Management Relations in Health Care
Sector III Planning and Finance
HSA 502. Financial Management Seminar
HSA 504. Strategic Planning for Health Care Institutions
HSA 530. Financing Health Care
HSA 531. Accounting for Health Care Institutions
HSA 532. Strategies for the Financial Managerial of Health Care Institutions
A maximum of 9 credits in Health Care designated courses may count toward satisfaction of the MBA degree requirements.
See section on Master of Health Service Administration for description of the Health Care concentration 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 ndependent 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)
A general introduction intended to acquaint managers with the characteristics, selection implementation, potentials, limitations and effects of modern management information systems.

Prerequisite: Admission to the MBA program or permission of The School of Business and Economics 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 nterest 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 Service Administration
Master of Health Service Administration
The Curriculum leading to the MHA provides opportunities for specialized professional studies for current and future executives in the health care and related industries. The objectives of the program are:

1. to develop expert managers skilled in organizational leadership, the assessment of community needs, and the delivery of quality service;
2. to deepen and broaden the MHA candidates' managerial and deci-sion-making techniques.
The program is transdisciplinary in design but physically resides in the Commerce and Finance Department under the cooperative aegis of the Chairman of the Commerce and Finance Department and the MHA Academic Coordinator. Although the study of Accounting, Finance, Operations Management, Marketing, and Human Resources Management are emphasized, opportunities exist for candidates to explore other academic areas at their discretion.

ADMISSIONS
Candidates are required to have a baccalaureate from an accredited nstitution. All applicants must demonstrate both a history of above average academic performance and the intellectual capacity for graduate studies.
An application for admission to graduate degree study at Wilkes Colege must be filed, along with all supporting documents, with the Division of Graduate Studies' office no later than July 15, preceding the fall semester, and November 15, preceding the spring semester. Applicants who file after the above mentioned dates may not be considered for admission to degree programs for the corresponding semester.

## Admission to graduate study involves the following

1. Completed Wilkes College Graduate Division Application for Ad mission (available from the graduate office) and payment of an ap plication fee of $\$ 25$ must be submitted to the graduate office
2. Along with the application the student should submit a professional career goal statement. The goal statement should contain

What are your basic goals?
How have you acquired these skills?
Which skills are you hoping to acquire?
What do you hope to achieve and do with the M.H.A.?
3. Graduates of colleges and universities must request that transcripts of undergraduate and any post-baccalaureate work be sent to the Graduate Office, Wilkes College, P.O. Box 111, Wikes-Barre, Pennsylvania 18766. Two letters of recommendation must be submitted to the graduate office by each applicant applying for admission to degree study. Forms of recommendation are available from the graduate office.
Once the graduate office receives all of an applicant's required docu ments, the credentials of the applicant will be reviewed and a final deci sion regarding admission to the degree program will be transmitted to the applicant. A student will be immediately assigned to a faculty pro-
gram advisor.

## M.H.A. Admission Criteria

An undergraduate degree in business will be helpful, however, nonbusiness majors are encouraged to apply. If any prerequisite courses are needed, this will be determined by the student and his/her advisor.

## DEGREE REQUIREMENTS

All MHA candidates must complete a total of 36 graduate credits comprised of 18 core credits, 9 concentration credits, and 9 elective credits. The core contains 6 multidisciplinary courses. There are 3 concentration areas: Long-Term Care Administration, Health Care Marketing, and Health Care Finance. The electives constitute a variety of courses that meet the needs of an eclectic student body. An internship ( 6 credits) also is available for those not currently employed in a health service organiza. tion.

## COURSES OF INSTRUCTION

## CORE COURSES ( 18 credits required)

## HSA 500. NATIONAL HEALTH POLICY

Three credits
The health care industry is becoming the largest segment of our American economy. The course seeks to introduce all important areas of this industry. Areas to be covered include: Medical personnel, allied health personnel, reimbursement techniques, public heath activities, nursing homes, ho
industry. (Offered every summer)
HSA 501. LEADERSHIP AND HUMAN RESOURCE MANAGEMENT IN HEALTH CARE INSTITUTIONS

Three credits This course will attempt to develop management approaches developed in industrial or ganizations and modify them appropriately for usage in health-service organizations. Management of health services, like the management of industrial organizations, re quires an integrated approach combining insights from several basic disciplines while
accounting for the unique characteristics of health-service organizations. The objectives of this course will be to provide a survey of concepts and methodologies basic to the managerial disciplines of organizational behavior operational research financial man agement and the law - all directly applicable to the management of health-service or ganizations. (Offered every fall)
SOC 540. MEDICAL SOCIOLOGY
Three credits
Surveys finding and methods in current applications of sociology to medicine. Includes a consideration of micro and macro scale social influences on the organization of medical institutions and practices. Considers such topics as the methods of sociomedical research; the nature of the patient-practitioner relationship; authority relations in the medical setting; the influence of organizational type on patient care; the effect of internal differentiation on the operation of the medical bureaucracy; the general characteristics of health and health care in America; social epidemiology of chronic diseases; community heath care; national health care; problems of the new technologies; death and dying (Ottered every fall)

HSA 502. FINANCIAL MANAGEMENT SEMINAR FOR HEALTH CARE PROVIDERS

## Three credits

Introduction to financial reimbursement techniques in the health care industry with discussions of the latest regulatory mechanisms to contain hospital costs, namely: price-percase reimbursement through the application of diagnosis related groups (DRG's). (Oftered every spring)
HSA 503. 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 con cepts such as demand and supply theory, market structure, opportunity cost, cost-benefi analysis, and p
HSA 504. STRATEGIC PLANNING FOR HEALTH CARE INSTITUTIONS

Three credits
This course will attempt to develop a strategic planning approach to the delivery of health services. The health care industry in the United States, consuming greater than 10\% of Gross National Product. External pressures, regulations, equilibrium or over-supply of hospital beds and physicians, nursing shortages, and activist consumers have combined to force health care managers to search for new approaches being given serious consideration in strategic planning. This course will develop the planning process and utilize it to prepare for the problems confronting the health care industry of the future. (Offered every spring)


## CONCENTRATION AREAS

| Long-Term Care Administration |  |
| :--- | :--- |
| Perspective On Aging | HSA 511 |
| Long-Term Care Administration | HSA 512 |
| Policies and Programs for the Elderly | HSA 513 |
| Health Care Marketing |  |
| Health Care Marketing <br> Health Care Product Development <br> Marketing Research and Information System <br> Health Care Finance | HSA 520 |
| Financing Health Care | HSA 521 |
| Accounting for Health Care Institutions <br> Strategies for the Financial Management <br> of Health Care Institutions | HSA 530 |
| Elective Courses | HSA 531 |
| Labor Management Relations in Health Care | HSA 532 |
| Ambulatory Care Management |  |
| Topics in Health Care Services Administration | HSA 540 |
| Health Care Independent Study |  |
| Health Care Internship ( 6 credits) | HSA 541 |

*Internship is optional; it is suggested for the individual not already employed in the health care fields.

## School of Engineering and Physical Sciences

Umid R. Nejib, (Ph.D.) Dean
Brian T. Redmond, (Ph.D.) Associate Dean
Jerome Kucirka (Ph.D.) Chairman
Master of Science in Electrical Engineering ADMISSION
a. Degree Track

For an applicant to be considered for admission to the graduate program in engineering, the file should contain the documents listed. However, if the items marked with an (*) are not included, the file will be reviewed and a conditional admission may be granted.
The requirements are:

1. Completed Graduate Division Application.
2. College and any other academic transcripts
3. Up-to-date resume.
4. Two letters of recommendation.
5. A copy of the B.S. degree in engineering or related fields, such as Physics, Computer Science, Chemistry, Mathematics, etc.

## 6. GRE Scores*

7. Foreign applicants should meet language, financial, and immigration requirements designated by the Graduate Studies Division*
8. Advanced standing or transfer credit requests if applicable. These are normally 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. Such students may elect to change thei status to the degree track and satisfying the requirements listed above.
The requirements are:

1. Completed Graduate Division Application*
2. College and any other academic Transcripts.
3. Up-to-date resume.
4. One letter of recommendation.
5. Copies of degrees or certificates.
6. Must satisfy the published prerequisites for the specific course.

## DEGREE REQUIREMENTS

Thirty-three (33) credit hours are required for the M.S.E.E. degree. These consist of the following:
3 credits in a Science, Technology and Ethics course EGR 400
9 credits three CORE graduate courses
EE 401 and 417, 432, 447, or 481
9 credits three INTERMEDIATE graduate courses
EE 414, 418, 420, 421, 460, 482, or 484
6 credits two ADVANCED graduate courses EE 500-level courses
6 credits in a research-oriented THESIS EE 590
Students may, with approval, use the following additional courses toward the M.S.E.E. requirements to a maximum of six (6) credits:
CS 364 Numerical Analysis
EE 335 Microwave \& Antenna Systems
EE 361 Communication Systems
EE 398 Topics in Electrical Engineering
Phy 351 Quantum Mechanics
Phy 398 Topics in Physics
Phy 435 Laser and Device Optics
Phy 452 Quantum Mechanics
Phy 498 Topics in Physics
Advanced standing or transfer credit is normally limited to six (6) graduate credits. Petitions should be submitted to the department graduate committee of the school of engineering and physical sciences and should document minimum competency defined as relevant graduate coursework at an accredited institution with an earned grade of 3.0 or equivalent expertise.

The minimum grade point average is 3.0 with a single grade of 2.0 being allowed. Students having satisfactorily completed 12 credits are designated as candidates and are allowed formally to start their research for the thesis.
To complete the requirements for the Master's Degree, a research-oriented thesis is compulsory. The thesis is presented and defended in an open oral. Three persons, including the faculty thesis advisor as chairman, constitute a thesis committee. One member of this committee will be from outside the department.

## COURSE DESCRIPTIONS

All students will be advised of the course offering, sequencing, and prerequisites upon admission to the program. The faculty advisor will be in a position to recommend courses to the student taking into account the time-table and the necessary prerequisite. Assessments and recommen dations will be made by the Department Graduate Committee.
The 500-level courses are restricted to students who have achieved candidacy status. All 400-level engineering courses require a background based on 300-level courses or the equivalent of the B.S. degree

## EGR 400. SCIENCE/TECHNOLOGY/ETHICS

Three credits
ent lies. The responsibilities and protections of professional status and the role of profes sonal societies. Acceptable behavior: insider and outsider views,

## EE 401. ANALYSIS

Three credits
The analysis of some physical and abstract problems using well developed mathematica lechniques such as contour integration, integral transforms, matrices, Bessel, Legendre, or Laguerre polynomials, FFT's, difference equations and numerical methods.

## E14. CONTROL SYSTEMS

Model of linear systems and general feedback theory. Analysis of closed loop systems using the root locus and frequency response techniques. Stability criterion, compensat ng techniques, senses and feedback compensation. Sampled and digital control sys tems.

## EE 417. NETWORK THEORY

Three credits
Analysis and synthesis; review of basic analysis techniques. Graph theory. Topological tomulas and their applications. Realizability conditions. Finding $\mathrm{H}(\mathrm{s})$ from part of $\mathrm{H}(\mathrm{jw})$ Scaling and frequency transformations. Filter design. Synthesis of LC, RC, and genera RLC one-port design. Synthesis of LC, RC, two-port networks.

## E418. INTRODUCTION TO COMPUTER

## COMNUNICATION NETWORKS

Three credits
Review of basic network theory. Communication media and symbols. Planning network layout. Computer hardware and software nodes. Network design and application.

## EE 420. SIGNALS AND SYSTEMS

Three credits
signal and system representations. Random signals and noise. Signal transformation and sampling methods. Discrete time signals and systems. Z-transform. DFT and FFT.

## EE 421. LINEAR SYSTEM THEORY

Three credits
Differential and difference equations. Vector-matrix equations and state variables. Con tollability, observability, and minimal realizations. System model conversions and linearition linear system response, general input/output problems, deterministic and sto chastic cases, identification. System performance in stability, fidelity, sensitivity, reliability

## Ee 432. ELECTROMAGNETIC FIELDS AND WAVES

Three credits
Review of Maxwell's equations, static and time varying fields, energy and momentum bal ance. Wave propagation, scattering, and diffraction. Waveguides and resonant cavities Coherence and dispersion. Dielectrics and magnetic materials. Stokes parameters and raytracing. Mode coupling. Radiation fields. Arrays. Applications.

EE 442. MICROPROCESSOR SYSTEM ORGANIZATION AND DESIGN
Miroprocessor pects of the design of digital and hybrid systems based on microprocessors. Case stud ies of specific design examples from varied applications.
EE 447. COMPUTERS, SYSTEMS, AND DEVICES
Three credits Principles of mechanization of computations, combinational switching logic, sequential systems. Designs of a modern computer system of organization input, output, mass storage, high speed memory, logic devices, large scale integration, timing, communications, multiprocessing, real-time systems.

EE 460. COMMUNICATION CIRCUITS AND SYSTEMS
Three credits
wave and electro-optical comm cation devices and systems. Tubes, amplifiers, and oscillators. Phase-locked loops and mixers. Modulation and demodulation. Transmitters and receivers. Multiplexing methods and systems. Applications and analysis.
EE 470. SOLID STATE DEVICES
Three credits
Quantum Mechanics. Block Theorem. Band Theory. Elementary excitation. Transport phenomena. Disordered systems. Defects. Alloys and Amorphous substances. Applica tions.

EE 481. ADVANCED SEMICONDUCTOR DEVICE FABRICATION LAB

Three credits
Theoretical and practical aspects of techniques utilized in the fabrication of semiconduo tor devices. Techniques of wet chemistry, oscillation, deposition, and diffusion. Advanced concepts of contamination control, defect-free processing, and gettering. Complete characterization including junction penetration, resistivity, oxide thickness, switching speed, junction characteristic leakage and gain. Ion implantation system and method of fabrication. Extensive use of process simulation programs such as SUPREM. Each student is required to completely fabricate bipolar devices and characterize the design in terms of leakage characteristics and gain.
EE 482. ADVANCED COMMUNICATION AND ANTENNA LAB Three credits Characterization and Measurement of Microwave Components, Devices, and Systems, Emphasis on Testing and Design Antenna using Swept Frequency Techniques, Utilization Antenna Range Test Facility. Microwavtenna Radiation, Pattern Measu and Testing Utilization in MW Systems, Coherent Optical Wave Generation and Modulation, Laser Communications.
EE 484. MATERIALS DIAGNOSTIC LABORATORY
Three credits
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 semiconducting materials. Magnetic properties study of perovskite and spinel classes of ferromagnetic compounds. Electron optic image formation and application for surface analysis by scanning electron microscopy, plus internal structural image observation of thin film of different materials by trans mission electron microscopy.

EE 498. TOPICS ELECTRICAL ENGINEERING ecture each week.

EE 505. REMOTE SENSING
Three credits
Introduction to remote sensing process. Review of electromagnetic and acoustic waves Principle and operation of various sensors: VIR, TIR, Radar and Sonar Sensor target inter action phenomenon. Signal and image processing. Pattern recognition and information on extraction. Varied applications in resource monitoring and non-destructive testing.
EE 516. OPTIMIZATION AND OPTIMAL CONTROL
Three credits
The calculus of variables and the maximum principle. Performance Criteria. Applications of the methods to linear and non-linear, deterministic and stochastic, continuous-time and discrete-time control
EE 540. AUTOMATION AND MANUFACTURING ENGINEERING Three credits State-of-the-art in automation and manufacture engineering. Lecture topics include sensor, robots and their application in manufacturing, flexible manufacturing systems, hu rials handling with computer graphics, computer-aided design, computer-aided engineering, and computer-aided manufacturing, reliability and quality control, planning and control. Application Examples
EE 560. COMMUNICATION THEORY
Thee credits
Detection of signals and estimation of signal parameters. Matched filters. Continuous modulation systems, effects of noise and interference, optimum detection, comparison o systems. Discrete time and digital modulation systems, sampling theorems, quantization optimum detection, error probability.

## EE 562. OPTICAL COMMUNICATION

Three credits
Fiber optics, light sources, lasers. Modulation and Multiplexing Coupling. Signal propapation and types of Fibers. Pulse Spreading Optical filters. Photodectors. Fourier Optics Communication System design and analysis.
EE 570. MODERN SOLID STATE DEVICES AND DESIGN
Three credits Bipolar, MOS and CMOS devices and processes. Performance limitations due to fabrica fion techniques. Current and future technologies for discrete devices and IC in electronics, electo-optics, and microwaves. VSLI design and implementation.
EE 590. THESIS
Three to six credits EE 598. ADVANCED TOPICS IN ELECTRICAL ENGINEERING

Three credits Selected topics in the field of electrical engineering. These may include one or more of the bolowing: control systems; information theory; signals and noise measurements; com munication systems; network design and synthesis; solid state; quantum electronics magnetic and non-linear circuits; digital and analog systems; computer systems; medica engineering; power systems and generation. May be repeated for credit. Three hours lecture each week

## Physics

## Master of Science in Physics

## ADMISSION

For admission to graduate study in physics, the applicant should possess an undergraduate degree in physics or in any other related science, mathematics, or engineering area with a minimum of 24 hours of undergraduate credits in physics. A knowledge of calculus and differentia equations is also required.
Students entering into the M.S. program in physics may be assumed to have widely 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 be prepared to enroll in two of these courses. *Students without the prerequisite background in quantum mechanics will take Physics 351 before Physics 452.

## DEGREE REQUIREMENTS

Thirty-three (33) credit hours are required for the M.S. in Physics. These consist of the following:
3 credits in Science, Technology and Ethics (Phy 400)
9 credits in CORE courses (Phy 401, Phy 423, Phy 452)
9 credits in $400-$ level** electives
6 credits in 500 -level electives
6 credits in THESIS (Phy 590)
To complete the requirements for the Master's Degree in Physics, a re search-oriented thesis is compulsory. The thesis is presented and de ended in an ope oral. Three persons, including the faculty thesis advisor as chairman, constitute a thesis committee. One member of this commit tee will be from outside the department.
The minimum grade point average is 3.0 with a single grade of 2.0 being allowed. Students having satisfactorily completed 12 credits are des gnated as candidates and are allowed formally to start their independent research for the thesis.
*General Prerequisites: (For Phy 401) Mathematical course work be yond differential equations. Familiarity with at least two of the following topics: linear algebra, special orthogonal functions, integral transforms, complex variables. (For Phy 432) A two-term undergraduate course in electromagnetism such as Phy 331, 332. (For Phy 452) An undergraduate senior-level quantum mechanics course such as Phy 351)
**A maximum of 6 credits of the following may be substituted here Approved 300 -level physics courses, approved 300 -level or 400 -leve non-physics courses. Approved by physics faculty is dependent on student's background and goals.

## COURSES OF INSTRUCTION

## 300-Level Approved Courses

Note: The following 300 -level courses are those currently approved for credit in the M.S inPhysics curriculum. For a complete list of 300 -evel physics courses refer to the current Wikes College undergraduate BULLETIN).
PHYSICS 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 theoretica methods, and others

PHYSICS 302. MATHEMATICAL METHODS II
Three credits Continuation of Physics 301
PHYSICS 310. ANALYTICAL MECHANICS
Three credits
An intermediate level course designed to develop an understanding of the principles o mechanics based on the Newtonian as well as the Lagrangian and Hamilton formulations. The application of matrices, tensors, and differential equations and advanced tech niques to the solution of mechanics problems. Topics include harmonic oscillations, cen tral 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.
PHYSICS 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 applicatures, cold work, preferred orientation, and ordering. Principles of design and applica week. Fee: $\$ 35$. (Same as MaE 311)
tors
PHYSICS 351. QUANTUM MECHANICS
Three credits
Anintroduction 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.

## PHYSICS 361/363. ATOMIC PHYSICS/LAB

Four credits
Planck's theory of cavity radiation, photons and the particle aspect of radiation, the wavePlanck's theory of cavity radiation, photons and the particle aspect of radiation, the waveiike 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 aptical excitations of multi-electron atoms, application of group theory to the normal modes of molecules, quantum statistics with simple applications to solids. Fee: $\$ 35$.
PHYSICS 370. INTRODUCTION TO SOLID STATE PHYSICS
Three credits Introduction to bonding and crystal structure, symmetry, considerations, reciprocal lat ice considerations, lattice dynamics, electronic structure of simple metals, insulators, and semiconductors, dielectric, ferroelectric, and magnetic properties of materials.

PHYSICS 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, elemen-
tary particles; unification. Fee: $\$ 35$.

PHYSICS 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, interfactory a week. Fee: $\$ 35$ (Same as CS 329)


Four credits
The theoretical ductor 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. tenna range test facility. Microwave communication link design and testing CAD ustirization 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

PHYSICS 400. SCIENCE, TECHNOLOGY AND ETHICS 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.

## PHYSICS 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, COURSE.

PHYSICS 411. ANALYTICAL MECHANICS
Three credits
Variational principles and Hamiltonian theory. Cannonical transformations and Gauge in variance. Descriptions of rigid body motions or other applications.
PHYSICS 425. ENERGY SYSTEMS
Three credits
The analysis of the conversion and transfer of energy in various systems of technical o scientific interest. High and low power density systems. Up and down scaling. Heat trans ier and storage. Entropy considerations.
PHYSICS 427. SOLID STATE DEVICES
Three credits Transistor processes and types. Properties of semiconductors and junctions. High cur renteffects and low frequency feedback effects. Low and high frequency hybrid parameters.
PHYSICS 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 resonalors and scattering by a sphere and other obstacles. CORE COURSE.

## PHYSICS 435. LASER AND DEVICE OPTICS

Three credits Gaussian beam optics. Non-linear optical effects; frequency doubling; lasing. Wave guid ing 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.
PHYSICS 452. QUANTUM MECHANICS
Three credits
Review of the important concepts and tools of quantum mechanics. Dirac notation, linea operators and unitarity. The Postulates. Bound and unbound states, unstable states Gauge invariance. The harmonic oscillator and phonons. The central potential and hy drogen-like systems. Applications. CORE COURSE.
PHYSICS 480. NUCLEAR AND HIGH ENERGY PHYSICS
Three credits Nuclear size and shapes. Radioactive decay. Alpha and Gamma emission. The Ferm theory of Beta decay. Nuclear reactions and subnuclear particles. Classification. Two nu deon interactions. Collective interactions

PHYSICS 491. PRACTICUM
Three to six credits
PHYSICS 498. TOPICS IN PHYSICS
One to three credits Topics dependent on interest and need. May be repeated for credit.

## 500-Level Courses

PHYSICS 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.
PHYSICS 535. LIGHT SCATTERING
Three credits
Classical and quantum descriptions of light scattering including Rayleigh scattering, Bril louin scattering and Raman scattering. Scattering in crystals and glasses. Stimulated and spontaneous emission. Coherence and resonance effects.
PHYSICS 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 statisics. Random processes and irreversible thermodynamics. Noise and fluctuations. The Onsager relations. The Boltzman transport equation.

## PHYSICS 550. ADVANCED QUANTUM MECHANICS

Three credits
cattering and scattering cross sections, partial wave analysis; applications. Angular momentum and Clebsch-Gordon coefficients. Stationary perturbation theory; time-depen dent perturbation theory; resonant perturbations and the decay or resonantly coupled tates
PHYSICS 571. THEORY OF SOLIDS Three credits
Energy band calculations. Phonons and other elementary excitations. Superconductiv ty, cooperative phenomena, order-disorder transitions.

PHYSICS 580. NUCLEAR PROCESSES
Three credits
Nuclear systems for power generation and other applications. Nuclear waste. Compan son of fossil fuel, and several fission schemes. Fusion schemes,
PHYSICS 590. THESIS
Three to six credits
PHYSICS 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 concentration in Physics

## ADMISSION

For admission to graduate study in physics education, the applicant should possess an undergraduate degree in physics or in any other re lated science, mathematics, or engineering area.

## DEGREE REQUIREMENTS

General requirements for the Master of Science in Education with a major in Physics are listed under Education on page 19. 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 $300-l e v e l$ physics courses. 400-level and 500-level physics courses are listed at the end of the next section.)

## Earth and Environmental Sciences

Brian T. Redmond, (Ph.D.) Chairman

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

Prerequisite: Senior or graduate standing

## Administration of the Graduate Program

Graduate programs at Wilkes College are the administrative responsi bility of the Dean of Graduate Studies and Continuing Education. A Fac ulty Committee on Graduate Studies acts in an advisory capacity to the Dean, and is listed below.

## FACULTY COMMITTEE ON GRADUATE STUDIES

Barbara Bellucci
Director of Microcomputer Education Regional Computer Resource Center Assistant Professor of Education Ed.D. (Temple)

| Suzanne M. Druffner | Associate Professor of Nursing <br> M.S. (Pennsylvania) |
| :--- | :--- |
| Mahmoud H. Fahmy | Dean of Graduate Studies <br> and Continuing Education <br> Professor of Education <br> Ph.D. (Syracuse) |
| Michael S. Garr | Assistant Professor of Sociology/Anthropology <br> Ph.D. (Indiana) |
| Thomas N. Kaska | Professor of English <br> Ph.D. (Duquesne) |
| Richard G. Raspen | Assistant Professor of Business Administration <br> M.B.A. (Wilkes), M.Ed. (Bloomsburg) |
| Richard E. Sours | Professor of Mathematics/Computer Science <br> Ph.D. (Virginia) |
| Robert D. Stetten | Associate Professor of Psychology <br> Ph.D. (Lehigh) |
| Robert J. Heaman | Ex Officio <br> Acting Vice President for Academic Affairs <br> Ph.D. (Michigan) | Ph.D. (Michigan)

Please send this form to:
Dr. Mahmoud H. Fahmy, Dean
Division of Graduate Studies
Division of Gradu Education
and Continuing
Wilkes College
Wilkes-Barre, PA 18766
Wilkes-Barre, PA 18766
and of the basis of race, color, national or ethnic origig, or handicap of be directed to the Affirmative Action Officer
Wilkes College does not discriminate on the basis of race, color, Ining applica
with applicable federal statutes and regun
Additional space for recommendation

## RECOMMENDATION FORM <br> Wilkes College <br> Division of Graduate Studies and Continuing Education

Name of applicant
Graduate Program desired

## Family Education Rights and Privacy Act (FERPA)

(Buckley Amendment)
of this Act you have the right, if you enroll in Wilkes College, to review your education record. The Act further provigning nder the provision that you may waive your right to see recommendat right.
your name, whether or not you wish to waive that right.
waive do not waive any right that I have to this recommendation form.


Signature of Respondent

Employment record

| Company or school system | Duties | Dates |
| :--- | :--- | :--- |
| Company or school system | Duties | Dates |
| Company or school system | Duties | Dates |

Letters of recommendation will be furnished from the following. Two are required, one of which must be from an Academic Dean or Faculty member at the academic institution attended.

| Name | Title | Address |
| :---: | :---: | :---: |
| 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? $\square$ Yes $\square$ No
Are you interested in applying for a position as a Resident Assistant? $\square$ Yes $\square$ No
Are you requesting financial assistance? $\square$ Yes $\square$ No

Applicant's signature__ Date $\qquad$

DO NOT WRITE BELOW THIS LINE

| Application fee received | Date |
| :---: | :---: |
| Transcripts complete | Date |
| Recommendation received | Date |
| Recommendation received | Date |
| TOEFL received (if applicable) | Date |
| Affidavit of Support | Date |
| Application forwarded to department | Date |
| Admission type | Date |
| V.A. identification (if applicable) |  |

An equal opportunity/affirmative action institution

# RECOMMENDATION FORM Wilkes College 

## Division of Graduate Studies

 and Continuing EducationName of applicant
Graduate Program desired

## Family Education Rights and Privacy Act (FERPA) <br> (Buckley Amendment)

Under the provision of this Act you have the right if you (Buckley Amendment)
hat you may waive your right to see recommendations for admissikes College, to review your education your name, whether or not you wish to waive that righ for admission. Please indicate below, by circling record. The Act further provides I waive do no
do not waive any right that I have to this recommendation form

## Applicant's signature

To person completing this recommendation:
Please evaluate the applicant on the serk is desired. Use reverse side if additional space is required

| Top 10\% Outstanding | Top 20\% Superior | Top Third Above | Middle Third | Bottom Third | Unable |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |
| Outstanding | Superior | Average Above |  | Below Average | to |
|  |  | Average | Average | Averaae Below | Judae |
|  |  |  |  | Average |  |



Division of Graduate Studies and Continuing Education


For further information, write or call: Dr. Mahmoud H. Fahmy, Dean
Division of Graduate Studies and Continuing Education Wilkes College Wilkes-Barre, PA 18766
Phone: (717) 824-4651, extension 226 Phone: (717) 824-4651, ext 32-5617
Toll-free from Scranton, PA 342-5 (800)

## WILKES COLLEGE 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 College.


Home Telephone_ $\qquad$ Business Telephone $\qquad$

Sex $\qquad$ Birth Date Social Security No. $\qquad$
Citizen of (indicate
country)__. Are you a veteran?___. VA benefits?___ $\qquad$

Name of high school $\qquad$ Date of graduation $\qquad$
Colleges or universities attended:
Name $\qquad$
$\qquad$
Name Dates Degree $\qquad$
Name Dates Degree $\qquad$
Major area of undergraduate study

Check status desired: $\square$ Degree Program
$\square$ Special non-degree

Check enrollment desired: $\square$ Part-time
$\square$ Full-time

Check program desired
$\square$ Master of Business Administration
Concentration: $\qquad$
$\square$ Master of Health Administration
Concentration: $\qquad$
$\square$ Master of Science in Electrical Engineering
$\square$ Master of Science in Mathematics
$\square$ Master of Science in Physics
$\square$ Master of Science in Education
Concentration in:

| Concentration in: | $\square$ English |
| :--- | :--- |
| $\square$ Biology | $\square$ Field Education |
| $\square$ Chemistry | $\square$ History |
| $\square$ Education (general) | $\square$ Mducational Computing |
| $\square$ Mathematics |  |
| $\square$ Elementary Education | $\square$ Physics |

Education Students: $\square$ Certified to teach


Division of Graduate Studies and Continuing 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 Continuing Education
Wilkes College
Wilkes-Barre, PA 18766
Phone: (717) 824-4651, extension 226
Toll-free from Scranton, PA 342-5617
From elsewhere in Pennsylvania (800) 572-4444
From Middle-Atlantic and New England Regions (800) 537-4444
(5)

## WILKES COLLEGE 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 College.
Name $\qquad$



Home Telephone $\qquad$ Business Telephone $\qquad$
Sex $\qquad$ Birth Date $\qquad$ Social Security No $\qquad$
Citizen of (indicate
country) . Are you a veteran? $\qquad$ VA benefits? $\qquad$

Name of high schoo $\qquad$ Date of graduation $\qquad$
Colleges or universities attended:
Name Dáates $\qquad$ Degree $\qquad$
Name
Dates Degree

Name
Dates Degree

Major area of undergraduate study $\square$
Check status desired: $\square$ Degree Program
$\square$ Special non-degree
Check enrollment desired: $\square$ Part-time
$\square$ Full-time
Check program desired
$\square$ Master of Business Administration
Concentration: $\qquad$
$\square$ Master of Health Administration
Concentration: $\qquad$
$\square$ Master of Science in Electrical Engineering
$\square$ Master of Science in Mathematics
$\square$ Master of Science in Physics
$\square$ Master of Science in Education
Concentration in:

| Concentration in: | $\square$ English |
| :--- | :--- |
| $\square$ Biology | $\square$ Field Education |
| $\square$ Chemistry | $\square$ History |
| $\square$ Education (general) | $\square$ Mathematics |
| $\square$ Educational Computing | $\square$ Elementary Education |

Education Students: $\square$ Certified to teach



Wilkes College


spring
Graduate
Studies
WILKES COLLEGE SPRING SEMESTER, 1988


## Graduate Studies <br> SPRING 1988 (TIMES IN LIGHT FACE REPRESENT A.M and TIMES IN BOLD FACE P.M.)

COLLEGE OF ARTS AND SCIENCES


| CHEMISTRY |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| CHEM 325 | Advanced Inorganic Chem. <br> (Prereq: CHEM 222 and 252) | TBA | T 2:30-4 | Chebolu | 3 |
| CHEM 361 $369: 30$ |  |  |  |  |  |
| Biochemistry I <br> (Preereq: CHEM 232) | TBA | M 2-4 | Stine | 3 |  |

EDUCATION

| ED 404 | Intern Teaching TBA | M thru F 8.4 | Johnson |
| :---: | :---: | :---: | :---: |
| ED 510 | Psychological KBY 302 Foundations of Education | M 4-7 | Ginsburgh |
| ED 514 | Historical DDD 202 Foundations of Education | W 6-9 | Williams |
| ED 531 | Children's Literature SLC 147 | T 4:30-6:30 | Meyers |
| ED 532A | Problems in DDD 101 Elementary Education - Mathematics | M 7-10 | Polacheck |
| ED 550 | Project T.E.A.C.H. TBA | TBA | TBA |
| ED 551 | P.R.I.D.E. TBA | TBA | TBA |
| ED 552 | Teaching Through TBA Learning Channels | TBA | TBA |
| ED 553 | Patterns for I.D.E.A.S. (Prev. Teaching Strategies) | TBA | TBA |
| ED 587 | Microcomputer Data SLC 403 Structures | M 6-9 | Pryor |

EDUCATION COURSES BY PERMISsIon

| ED 533 | PIES | SLC 150 | T6-9 | Placek |
| :---: | :---: | :---: | :---: | :---: |
| ED 580 | Computer Literacy Elementary | SLC 127 | W6.9 | Pryor |
| ED 580 | Computer Literacy Secondary | SLC 127 | M 6-9 | Koch |
| ENGLISH |  |  |  |  |
| ENG 301E | Literary Criticism | KBY 302 | Th 6-9 | Kaska |
| ENG 312E | Chaucer | SLC 347 | T6-9 | Fiester |
| ENG 330A | 17th Century Prose \& Poetry | KBY 309 | TTh 2:30-3:45 | Kaska |
| ENG 366A | Later English Novel | KBY 309 | MWF 2-2:50 | Terry |
| ENG 386A | Modern American Poet | $\begin{aligned} & \text { SLC } 311 \\ & \text { SLC } 207 \end{aligned}$ | TThF 9-9:50 | Gutin |
| ENG 398A | Cont. American Fiction | SLC 316 | TTh 4-5:15 | P. Heaman |
| ENG 480E | Studies in American Lit. | SLC 316 | TTh 4-5:15 | P. Heaman |
| ENG 497E | Seminar: T. S. Eliot | KBY 302 | W 6-9 | Gutin |

HISTORY/POLITICAL SCIENCE

| HST 332A | National Period | SLC 160 | TTh 9:30-11 | Meyers | 3 |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| HST 333E | The Age of | Capin 15 | M 6:30-9:30 | Cox | 3 |  |
|  | Big Business |  |  |  |  |  |
| HST 352A | Renaissance and | SLC 160 | MWF 11-11:50 | Sterling | 3 |  |
| HST 362A | Reformation | History of the Far East | SLC 204 | MWF 9.9:50 | Shao | 3 |
| HST 398A | Topics: Modern | SLC 204 | TTh 1-2:30 | Tutwiler | 3 |  |
|  | Middle East |  |  |  |  |  |
| PS 307A | American Presidency | SLC 204 | MWF 11-11:50 | Behuniak-Long | 3 |  |
| PS 332A | Constitutional Law | SLC 204 | MWF 2-2:50 | Behuniak-Long | 3 |  |
| PS 335A | Amer. Political Thought | SLC 204 | TTh 9:30-10:45 | Tuhy | 3 |  |
| PS 398A | Topics: Modern | SLC 204 | TTh 1-2:30 | Tutwiler | 3 |  |
| PS 398E | Middle East | Topics: Public Policy | SLC 204 | T 6:30-9:30 | Tuhy | 3 |

## MATHEMATICS/COMPUTER SCIENCE

MA 342A Intro. to Topology SLC 405 MW 4-5:15 Hong 3
MA 354A Statistical Modeling SLC 424 TTh 1-2:15 Merrill 3
MATH 362A Intro. to Applied SLC 409 TTh 9:30-11 Sours 3
CS 328A Analysis of
SLC 409 MWF 12-12:50 Andeson 3

| BUSINESS ADMINISTRATION |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Course | Description | Room | Day \& Hour M 6-9 | Instructor Croop | Creatr |
| ACCT 501E | Financial \& Managerial (Prereq: ACCT 101, ACCT 102, | BA 225) |  |  |  |
| ACCT 562E | Financial \& Tax | DDD 202 | T6-9 | C. Chisarick | 3 |
|  | Planning |  |  |  |  |
| BA 595E | Independent Research | TBA | TBA | TBA | 3 |
| BA 507E | Business and Society | SLC 316 | T 6-9 | Raspen |  |
| BA 507E1 | Business and Society | SLC 359 | Th 6-9 | Raspen |  |
| BA 512E | Price Policy and Procedure | SLC 342 | T 6-9 | Taylor | 3 |
| BA 514E | Market Research and Experimentation | SLC 318 | W 6-9 | Batory | 3 |
| BA 522E | Quantitative Aspects of Management | SLC 204 | Th 6-9 | Penugonda | 3 |
| BA 550E | Topics: SBA | TBA | TBA | Chmiola | 3 |
| BA 550E1 | Topics: Options and Futures | SLC 204 | W 6-9 | Engel |  |
| BA 552E | Financial Managament | SLC 334 | M 6-9 | Engel |  |
| BA 558E | Risk Management | SLC 311 | Th 6-9 | Farrar | 3 |
| BA 595E | Independent Research | TBA | TBA | TBA | 3 |


| ECONOMICS |  |  | Cordora | 3 |  |
| :--- | :--- | ---: | :--- | :--- | :--- |
| EC 505E | Managerial Statistics | SLC 209 | W 6-9 | H. Williams | 3 |
| EC 510E | Managerial Economics | SLC 316 | M 6-9 | TBA | 3 |
| EC 595E | Independent Research | TBA | TBA |  |  |


| HSA 502E | Financial Management SLC 342 (Sem. for Health-Care Providers) | T6-9 | Menichello | 3 |
| :---: | :---: | :---: | :---: | :---: |
| HSA 504E | Strategic Planning SLC 204 for Health-Care Institutions | M 6-9 | Healey | 3 |
| HSA 512E | Long-Term Care SLC 311 Administration | W6-9 | Livingstone | 3 |
| HSA 520 | Health Care Marketing Darte 101 Friday Evening 6-9 Saturday 9.4 | Weekender <br> Jan. 22, 23 <br> Feb. 12, 13 <br> Mar. 4, 5 <br> Apr. 1, 2 <br> Apr. 29, 30 | Healey | 3 |
| HSA 522E | Market Research SLC 316 | W 6-9 | Atzrott | 3 |
| HSA 550E | Epidemiology in $\quad$ SLC 316 Health Care | Th 6-9 | Houseknecht | 3 |
| HSA 550E2 | $\begin{aligned} & \text { Current Perspectives: } \quad \text { TBA } \\ & \text { Drug and Alcohol Abuse } \end{aligned}$ | TBA | Ambrosino | 3 |
| HSA 550E3 | Organizational Behavior SLC 209 Communication \& International Skills Organizations | T6-9 <br> s in Health Care | Basu | 3 |
| HSA 550E4 | Medical Management SLC 342 Information Systems: Management | Th 6-9 Perspectives | O'Hop | 3 |
| HSA 590 | Health Care Internship TBA | TBA | Basu | 3 |

engineering

| Course | Description | Room | Day \& Hour |  |
| :---: | :---: | :---: | :---: | :---: |
| EE 398G-A | Topics: Robotics | SLC 223 | TTh 2:30-4 | Misra |
| EE 398G-B | Topics: Digital Filter Design | SLC 224 | MWF 1-1:50 | Srinivasan |
| EE 414G-E | Control Systems | SLC 318 | M 6:30-9:15 | Mohseni |
| EE 432G-E | Electromagnetic Fields \& Waves | SLC 223 | T 6:30-9:15 | Hostler |
| EE 482G-E | Adv. Communication \& M. W. Lab | $\begin{aligned} & \text { SLC } 224 \\ & \text { SLC } 224 \end{aligned}$ | $\begin{aligned} & \text { M 5:15-6:15 } \\ & \text { M 6:16-11 } \end{aligned}$ | Yeroushalmi |
| EE 498G-B | Topics: Digital Filter Design | SLC 223 | MWF 1-1:50 | Srinivasan |
| EE 498G-E | Topics: IC Circuit Design | SLC 223 | W 6:30-9:15 | Choudhry |
| EGR 498G-E1 | Topics: Expert Systems CIM | SLC 424 | MW 6:30-7:45 | Lee |
| EE 562G-E | Optical Communication | SLC 223 | 8-9:15 | Armand |


| PHY 302G-E | Math in Physics <br> and Science II | SLC 166 | W 6:30-9:15 | Bellas | 3 |
| :--- | :--- | ---: | :--- | :--- | :--- |
| PHY 310G-A | Mechanics | SLC 147 | TTh 9:30-10:45 | Loncoski | 3 |
| PHY 361G-A | Atomic Physics | SLC 42 | TThF 1-1:50 | Maxwell | 4 |
| PHY 363G•A | Atomic Physics Lab | SLC 42 | W 2:30-5:30 | Maxwell | 0 |
| PHY 432G-E | Electromagnetic | SLC 223 | TTh 6-7:15 | Hostler | 3 |
|  | Fields \& Waves |  |  |  |  |

## Special Feature

Wilkes College Masters degree in Health Administration is accredited and formally approved by the Division of Academic Program Approval, Department of Education of the Commonwealth of PennsyIvania. The College is an Associate Member of University Programs in Health Administration (AUPHA).

Wilkes College is a member of the Council of Graduate Schools in the United States and Pennsylvania Association of Graduate Schools
The Wilkes College Master of Business Administration is currently offered in Lehigh Valley and Allentown area through Allentown College Sancti, Francisci Sales II.
The Division of Graduate Studies and Continuing Education is offering a variety of non-credit courses, workshops and seminars in professional development, cultural en richment and personal improvement. (There is a special brochure for the Continuing

COLLEGE OF ARTS AND SCIENCES

| BIOLOGY |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Course <br> BIO 304A | Description <br> Life of the Vertebrates (Prereq: BIO $121 \cdot 122$ or perm | $\begin{gathered} \text { Room } \\ \text { SLC } 359 \\ \text { sion of instructo } \end{gathered}$ | Day \& Hour <br> TTh 9-9:50 <br> or) | Instructor Houseknecht | $\begin{gathered} \text { Credit } \\ 3 \end{gathered}$ |
| BIO 304A1 | Lab Fee: \$35.00 | SLC 378 | W 2-4:45 | Houseknecht | 0 |
| BIO 308A | Genetics (Prereq: B10 121 -122 or perm | $\begin{aligned} & \text { SLC } 359 \\ & \text { ssion of instructo } \end{aligned}$ | $\underset{\text { tor) }}{\text { MW }} 10-10: 50$ | Turoczi | 3 |
| BIO 308A1 | Lab Fee: \$35.00 | SLC 370 | T 2-4:45 | Turoczi | 0 |
| BIO 319A | Plant Diversity (Prerea: B10 121-122, 223.22 | $\begin{gathered} \text { SLC } 359 \\ 4 \text { or permission } \end{gathered}$ | TTh 1-1:50 of instructor) | Klemow | 3 |
| BIO 319A1 | Lab Fee: \$ $\$ 5.00$ | SLC 349 | M 2-4:45 | Klemow | 0 |
| $\begin{aligned} & \text { B10 397A } \\ & \text { B1O } 398 \mathrm{~A} \end{aligned}$ | Sominar Todics: Histology (Prereq: BIO 121-122 or per | $\begin{gathered} \text { SLC } 359 \\ \text { SLC } 359 \\ \text { ssion of instructo } \end{gathered}$ | $\begin{aligned} & \text { Th 3-4:50 } \\ & \text { TTh 10-10:50 } \end{aligned}$ <br> tor) | Houseknecht | ${ }_{3}^{1}$ |
| BIO 398A1 | Lab Fee: \$35.00 | SLC 305 | Th 2-4:45 | Long | 0 |

CHEMISTRY

| CHEM 325 | Advanced Inorganic Chem. <br> (Preeq: CHEM 222 and 252) | TBA | T 2:30-4 <br> Th $8-9: 30$ | Chebolu | 3 |
| :--- | :--- | :--- | :--- | :--- | :--- |
| CHEM 361 | Biochemistry I <br> (Prereq: CHEM 232) | TBA | M 2-4 <br> F 9-9:50 | Stine | 3 |
|  |  | F |  |  |  |

EDUCATION

| ED 404 | Intern Teaching TBA | M thru F 8.4 | Johnson | 3 |
| :---: | :---: | :---: | :---: | :---: |
| ED 510 | Psychological KBY 302 Foundations of Education | M 4-7 | Ginsburgh | 3 |
| ED 514 | Historical DDD 202 Foundations of Education | W 6-9 | Williams | 3 |
| ED 531 | Children's Literature SLC 147 | T 4:30-6:30 | Meyers | 3 |
| ED 532A | Problems in DDD 101 Elementary Education - Mathematics | M 7-10 | Polacheck | 3 |
| ED 550 | Project T.E.A.C.H. TBA | TBA | TBA | 3 |
| ED 551 | P.R.I.D.E. TBA | TBA | TBA | 3 |
| ED 552 | Teaching Through TBA Learning Channels | TBA | TBA | 3 |
| ED 553 | Patterns for I.D.E.A.S. (Prev. Teaching Strategies) | TBA | TBA | 3 |
| ED 587 | Microcomputer Data SLC 403 Structures | M 6-9 | Pryor | 3 |

EDUCATION COURSES BY PERMISSION

| ED 533 | PIES | SLC 150 | T 6-9 | Placek | 3 |
| :--- | :--- | :--- | :--- | :--- | :--- |
| ED 580 | Computer Literacy | SLC 127 | W6-9 | Pryor | 3 |
|  | Elementary |  |  |  |  |
| ED 580 | Computer Literacy    <br>  Secondary SLC 127 M 6-9 | Koch | 3 |  |  |

## english

ENG 301E Literary Criticism KBY 302 Th 6-9 Kaska 3

| ENG 312E | Chaucer | SLC 347 | T6-9 | Fiester | 3 |
| :--- | :--- | :--- | :--- | :--- | :--- |


| ENG 330A | 17th Century | KBY 309 | TTh 2:30-3:45 | Kaska | 3 |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  | Prose \& Poetry |  |  |  |  |
|  |  |  |  |  |  |

ENG 386A |  | Modern American Poet | SLC 311 | TThF 9.9:50 | Gutin | 3 |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  |  | SLC 207 |  |  |  |

| ENG 398A | Cont. American Fiction | SLC 316 | TTh 4-5:15 | P. Heaman | 3 |
| :--- | :--- | :--- | :--- | :--- | :--- |
| ENG 480E | Studies in American Lit. | SLC 316 | TTh 4-5:15 | P. Heaman | 3 |
| ENG 497E | Seminar: T. S. Eliot | KBY 302 | W 6-9 | Gutin | 3 |


| HST 332A | National Period | SLC 160 | TTh 9:30-11 | Meyers |
| :---: | :---: | :---: | :---: | :---: |
| HST 333E | The Age of Big Business | Capin 15 | M 6:30-9:30 | Cox |
| HST 352A | Renaissance and Reformation | SLC 160 | MWF 11-11:50 | Sterling |
| HST 362A | History of the Far East | SLC 204 | MWF 9.9:50 | Shao |
| HST 398A | Topics: Modern Middle East | SLC 204 | TTh 1-2:30 | Tutwiler |
| PS 307A | American Presidency | SLC 204 | MWF 11-11:50 | Behuniak-Long |
| PS 332A | Constitutional Law | SLC 204 | MWF 2-2:50 | Behuniak-Long |
| PS 335A | Amer. Political Thought | SLC 204 | TTh 9:30-10:45 | Tuhy |
| PS 398A | Topics: Modern Middle East | SLC 204 | TTh 1-2:30 | Tutwiler |
| PS 398E | Topics: Public Policy | SLC 204 | T 6:30-9:30 | Tuhy |

## MATHEMATICS/COMPUTER SCIENCE

| MA 342A | Intro. to Topology | SLC 405 | MW 4-5:15 | Hong | 3 |
| :--- | :--- | :--- | :--- | :--- | :--- |
| MA 354A | Statistical Modeling | SLC 424 | TTh 1-2:15 | Merrill | 3 |
| MATH 362A | Intro. to Applied | SLC 409 | TTh 9:30-11 | Sours | 3 |
|  | Math II |  |  |  |  |
| CS 328A | Analysis of | SLC 409 | MWF 12-12:50 | Andeson | 3 |

BA 507E1
Business and Socitty Price Policy and Procedure BA 514E BA 522E

|  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| BA 507E1 | Business and Society | SLC 359 | Th 6-9 | Raspen | 3 |
| BA 512E | Price Policy and Procedure | SLC 342 | T 6-9 | Taylor | 3 |
| BA 514E | Market Research and Experimentation | SLC 318 | W 6-9 | Batory | 3 |
| BA 522E | Quantitative Aspects of Management | SLC 204 | Th 6-9 | Penugonda | 3 |
| BA 550E | Topics: SBA | TBA | TBA | Chmiola | 3 |
| BA 550E1 | Topics: Options and Futures | SLC 204 | W 6-9 | Engel | 3 |
| BA 552E | Financial Managament | SLC 334 | M 6-9 | Engel | 3 |
| BA 558E | Risk Management | SLC 311 | Th 6-9 | Farrar | 3 |
| BA 595E | Independent Research | TBA | TBA | TBA | 3 |
| ECONOM |  |  |  |  |  |
| EC 505E | Managerial Statistics | SLC 209 | W 6-9 | Cordora | 3 |
| EC 510E | Managerial Economics | SLC 316 | M 6-9 | H. Williams | 3 |
| EC 595E | Independent Research | TBA | TBA | TBA | 3 |
| HEALTH | SERVICE ADMINIS | STRATION | ON (MHA) |  |  |
| HSA 502E | Financial Management (Sem. for Health-Care P | $\begin{aligned} & \text { SLC } 342 \\ & \text { roviders) } \end{aligned}$ | T 6-9 | Menichello | 3 |
| HSA 504E | Strategic Planning for Health-Care Institutio | $\text { SLC } 204$ | M 6-9 | Healey | 3 |
| HSA 512E | Long-Term Care Administration | SLC 311 | W 6-9 | Livingstone | 3 |
| HSA 520 | Health Care Marketing Friday Ev Saturday | Darte 101 ening 6-9 9.4 | Weekender <br> Jan. 22, 23 <br> Feb. 12, 13 <br> Mar. 4, 5 <br> Apr. 1, 2 <br> Apr. 29, 30 | Healey | 3 |
| HSA 522E | Market Research | SLC 316 | W 6-9 | Atzrott | 3 |
| HSA 550E | Epidemiology in Health Care | SLC 316 | Th 6-9 | Houseknecht | 3 |
| HSA 550E2 | Current Perspectives: Drug and Alcohol Abus | TBA |  | Ambrosino | 3 |
| HSA 550E3 | Organizational Behavior Communication \& Inter Organizations | SLC 209 national Skill | T 6-9 <br> Is in Health Care | Basu | 3 |
| HSA 550E4 | Medical Management Information Systems: | SLC 342 anagement | Th 6-9 Perspectives | O'Hop | 3 |
| HSA 590 | Health Care internship | TBA | TBA | Basu | 3 |
| SCHOOL OF ENGINEERING AND PHYSICAL SCIENCES |  |  |  |  |  |

## AND PHYSICAL SCIENCES

## enginiesting

| Course <br> EE 398G-A | Description Topics: Robotics | $\begin{array}{r} \text { Room } \\ \text { SLC } 223 \end{array}$ | Day \& Hour <br> TTh 2:30-4 | Instructor Misra | ${ }_{3}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| EE 398G-B | Topics: Digital Filter Design | SLC 224 | MWF 1-1:50 | Strinivasan | 3 |
| EE 414G-E | Control Systems | SLC 318 | M 6:30-9:15 | Mohseni |  |
| EE 432G.E | Electromagnetic Fields \& Waves | SLC 223 | T 6:30-9:15 | Hostler | 3 |
| EE 482G-E | Adv. Communication \& M. W. Lab | $\begin{aligned} & \text { SLC } 224 \\ & \text { SLC } 224 \end{aligned}$ | $\begin{aligned} & \text { M 5:15-6:15 } \\ & \text { M 6:16-11 } \end{aligned}$ | Yeroushalmi |  |
| EE 498G-B | Topics: Digital Filter Design | SLC 223 | MWF 1-1:50 | Srinivasan |  |
| EE 498G-E | Topics: IC Circuit Design | SLC 223 | W 6:30-9:15 | Choudhry |  |
| EGR 498G-E1 | Topics: Expert Systems CIM | SLC 424 | MW 6:30-7:45 | Lee |  |
| EE 562G.E | Optical Communication | SLC 223 | 8-9:15 | Armand | 3 |
| EE 590G.E | Thesis (01.03) | TBA | TBA | TBA |  |

PHYSICS

| PHY 302G-E | Math in Physics and Science II | SLC 166 | W 6:30-9:15 | Bellas | 3 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| PHY 310G-A | Mechanics | SLC 147 | TTh 9:30-10:45 ${ }^{\prime}$ | Loncoski | 3 |
| PHY 361G-A | Atomic Physics | SLC 42 | TThF 1-1:50 | Maxwell | 4 |
| PHY 363G-A | Atomic Physics Lab | SLC 42 | W 2:30-5:30 | Maxwell | 0 |
| PHY 432G-E | Electromagnetic Fields \& Waves | SLC 223 | TTh 6-7:15 | Hostler | 3 |

> Special Feature

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General information
Calendar
Registration for Graduate Students - Spring 1988:
*Please note: All registrations are to be made at the Registran's Office. Further information concerning courses, etc. will be available at the Graduate Studies Office during the same hours listed below.
First day of Registration
Dec. 7. . . . . . . . . . . . . . . . . . . . 8:30 a.m. to 4:30 p.m.
After Dec. 7, Mon. through Fri. . . 8:30 am. to 4:30 p.m. Offices closed:
December 24, 25, 31, 1987 through January 1, 1988.
Extended Days of Registration
Wednesday, Jan. 13 ............ . 8:30 a.m. to 8:00 p.m.
Thursday, Jan. 14 . . . . . . . . . . . . .8:30 a.m. to 8:00 p.m.
Classes Begin
Wednesday, Jan. 20 (Follow Monday's Class Schedule)
Wednesday, Feb. 17 . . . . . . . . . . . . . . . . . . Fall Break
Monday, Feb. 22. . . . . . . . . . . . . . . . . Classes resume
Friday, March 25 ........................ Easter Break
Tuesday, April $5 \ldots$. . . . . . . Classes resume at 8:00 am.
Friday, May 6 . . . . . . . . . . . . . . Classes end at 5:00 p.m.
Monday, May 9 through
Saturday, May 14. .
Sunday, May 22, $1988 \ldots$. . Commencement at 11:00 am.


Wilkes College
Division of Graduate Studies
and Continuing Education
Wilkes-Barre, Pennsylvania 18766
$\qquad$
$\square$

Wilkes College offers the Master of Business Administration Degree, Master of Science in Electrical Engineering Degree, Master of Health Service Administration Degree, Master of Science Degrees in Mathematics and Physics, and a Master of Science Degree in Education with concentrations in Biology, Chemistry, Education, Educational Computing, Elementary Education, English, Education Development and Strategies, History, Mathematics or Physics.

Wilkes College Graduate programs are approved and accredited by the Pennsylvania Department of Education and Middle States Association of Colleges and Schools.
Application
Application for admission to Wilkes College Graduate Studies should be made to the Division of Graduate Studies and Continuing Education, Second Floor, Max Roth Center, 215 South Franklin Street, Wilkes-Barre, Pennsylvania, 18766.
Registration
Course registration is made at the Registrar's Office located in Sturdevant Hall, 129 South Franklin Street, Wilkes-Barre, Pennsylvania, 18766. Registration forms can be obtained by calling the Registrar's Office at 824-4651, ext. 350 or 303. Complated forms may be returned in person or by mail.
The College reserves the right to cancel or reschedule any course due to insufficient enrollment or any other reason. When possible, any students who have registered for courses that are subsequently cancelled or rescheduled will be notified as promptly as possible.
Fees and Expenses
The cost of each graduate credit is $\$ 195$ plus a $\$ 3$ per credit hour general College fee. Laboratory fees are as indicated.

Payment is to be made at the Finance Office, First Floor, Sturdevant Hall, 129 South Franklin Street, Wilkes-Barre, Pennsylvania, 18766.
Information about Veterans' Benefits is available through the Veterans' Affairs Office, First Floor, Sturdevant Hall.
Deferred Payment and Third-Party Billing forms can be obtained at the Finance Office. These forms must be submitted each semester.
Withdrawal
Graduate students may withdraw, without prejudice, from any course at any time during the first four weeks of the semester, providing they give written notice to the instructor and to the Dean of Graduate Studies within this four-week period. Withdrawal and Add forms can be obtained at the Graduate Studies Office. (Charges for courses from which a student withdraws
will be calculated as of the date recorded on the official Withdrawal form.)
Students who have paid their tuition in full and who withdraw from courses or from the College will receive a refund of tuition, upon written request to the Dean of Graduate Studies, according to the following schedule:

Time of Withdrawal
Prior to January 20
January 20 - February 2
February 3 -February 16
February 17 - February 24
Tuition Refund 100\% 80\%
60\% 40\%
No refund will be issued after February 24. Course \& Lab fees are non-refundable. No student who is suspended or expelled shall be entitled to any refund.
Financial Aid
Inquiries about financial aid should be made to the Financial Aid Office, Sturdevant Hall, second floor, 129 South Franklin Street.
Library
The Eugene Shedden Farley Library is open to all Wilkes students. Graduate students may borrow books from the Library by presenting their College identification cards. The identification cards may be obtained at the Registrar's Office. Hours for the Library are posted at the beginning of each academic session.
Bookstore
The College Bookstore is located in the lower level of Pickering Hall. The Bookstore is open from 8:30 a.m. to 4:30 p.m. Monday through Friday. The Bookstore will be open January 18 and 19 from 8:00 a.m. to 8:00 p.m. January 20 and 21 from 8:00 a.m. to 6:30 p.m.

For further information, write or call:
DR. MAHMOUD H. FAHMY, Dean
Division of Graduate Studies and Continuing Education 215 South Franklin Street
Wilkes-Barre, Pennsylvania 18766
Phone: (717) 824-4651 Extension 226
Toll-free: from Scranton, Pennsylvania 342-5617 from elsewhere in Pennsylvania (800) 572-4444 from outside of Pennsylvania (Middle Atlantic and New England Regions) (800) 537-4444


## Wilkes College Spring Semester 1988 <br> - GENERAL INFORMATION -

Calendar for Spring Semester 1988

Registration for Evening College and Part-Time Day-Schoo Students:
Wednesday, Jan. 13
Thursday, Jan. 14
Wednesday, 14 . . . . . . . . . . . . . . . . 8:3:30 a.m. to 8. m 8:00 p.m.
Friday, Feb. 19 . . . . . . . . . . . . . . Winter recess begin at 8:00 a.m.
Wednesday, Feb. 24 . . . . . . . . . . . . . Classes resume at 8:00 a.m.
Friday, March $25 . . . . .$. . . . . Easter recess begins at 5:00 p.m.
Tuesday, April 5 . . . . . . . . . . . . . . Classes resume at 8:00 a.m.
Friday, May 6 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Classes end
Saturday, May 9, thru Saturday, May 14 . . . . Final Examinations

Weekend College (at Keystone Junior College)

Schedule

January 8 to April 17 (including Final Examinations)
Registration .............................................................. 8 (Weekender Office, La Plume, Pa.) 4:30-6:30 p.m.

Wilkes College is accredited by The Department of Public instruction of the State of Pennsylvania and the Middle States As sociation of Colleges and Secondary Schools. The Chemistry curriculum has been certified by the American Chemical Society. The Electrical Engineering and Materials Engineering programs are fully accredited by the ABET, the sole accrediting agency for engineering and technology programs in the U.S.

Application for admission to Wilkes College as an evening college; part-time day-school or weekend college student should be made to the Office of Evening, Summer and Weekend College, Chase Hall, 184 South River Street, Wilkes-Barre, Pennsylvania 18766. Application for admission to Wilkes College as a full-time undergraduate student should be made to the Dean of Admissions.

Books, stationery and supplies may be purchased at the College Bookstore, located on the lower level of Pickering Hall. They must be paid for at the time of purchase. The Bookstore is open from 8:30 a.m. to 4:30 p.m. Monday through Friday.

The College reserves the right to cancel or reschedule any course due to insufficient enrollment or any other reason. When possible, any change in the course schedule will be posted during registration. Students who have registered for courses that are subsequently cancelled or rescheduled will be notified as promptly as possible.

A "Certificate of Achievement" is available to undergraduate students in the field of Business Administration who earn 42 hours of credit in Evening College and Summer School programs with at least 24 hours in Business Administration and 18 hours in general education. Specific course requirements are available on request.

All charges must be paid at the time registration forms are processed.

Undergraduate students who register for fewer than 12 credits pay $\$ 150$ per credit.
Undergraduate students who register for 12 through 18 credits pay a flat tuition fee of $\$ 3,215$ per semester. (Students who take more than 18 credits pay $\$ 150$ for each credit above 18.)

Part-time as well as full-time students have a variety of aid programs available to them, but students must make formal application to establish their eligibility. Therefore, ALL undergraduate students are urged to apply for Financial Aid. Forms for this purpose are available in the Financial Aid Office. Inquiries about financial aid should be made to the Financial Aid Office. Information about Veterans' Benefits is available through the Veterans' Affairs Office (Ext. 227).

The Eugene Shedden Farley Library is open to all Wilkes students. Students may borrow books from the Library by presenting their College identification cards. Hours are posted at the beginning of each academic session.

Evening college; part-time day-school and weekend college students may withdraw, without prejudice, from any course at any time during the first 6 weeks of the semester, providing that they give written notice to the instructor and to the Director of Evening, Summer and Weekend College within this 6 -week period (Charges for courses from which a student withdraws will be calculated as of the date recorded on the official withdrawal form.)

Students who have paid their tuition in full and who withdraw from courses or from the College will receive a refund of tuition upon written request to the Comptroller's Office, according to the following schedule:

Time of withdrawal
First two weeks

Tuition Refund
vinuction of the State of Pennsvlyania and the Midde Staiic in sociation of College and Secondary Schools. The Chemistry curriculum has been certified by the American Chemical Soci ety The Electrical Engineering and Materials Enginering pro grams are fully accredited by the ABET, the sole accrediting agency for engineering and technology programs in the U.S.

Admissions

Bookstore

Change Of
Schedule

Day-Care

Degree
Programs

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The College reserves the right to cancel or reschedule any course due to insufficient enrollment or any other reason. When possible, any change in the course schedule will be posted during registration. Students who have registered for courses that are subsequently cancelled or rescheduled will be notified as promptly as possible.

Day-Care is available for young children of Wilkes students from 7:00 a.m. to 5:30 p.m. at Child Development Council Centers near the campus. These services are partially subsidized by the College. For further information, contact Ms. Anne Graham, 824-4651, extension 367.

## Bachelor of Arts:

Art
Biology
Chemistry
Communication Studies
Computer Information
$\quad$ Systems
Computer Science
Earth \& Environmental
$\quad$ Sciences
Economics

English
Bachelor of Science:
Accounting
Biology
Business Administration
Chemistry
Computer Science
Earth \& Environmental Sciences Engineering (a) Electrical Engineering
(b) Engineering Management

Foreign Languages History Individualized Studies International Studies Mathematics
Philosophy
Physics
Political Science
Psychology
Sociology
Theater Arts
(c) Environmental Engineering (d) Materials Engineering Individualized Studies Mathematics
Medical Technology Medical \& Health Physics Nursing
nquiries about financial aid should be made to the Financial Aid Office. Information about Veterans' Benefits is available through the Veterans' Affairs Office (Ext. 227).

The Eugene Shedden Farley Library is open to all Wilkes students. Students may borrow books from the Library by presenting their College identification cards. Hours are posted at the beginning of each academic session.

Evening college; part-time day-school and weekend college students may withdraw, without prejudice, from any course at any time during the first 6 weeks of the semester, providing that they give written notice to the instructor and to the Director of Evening, Summer and Weekend College within this 6 -week period. (Charges for courses from which a student withdraws will be calculated as of the date recorded on the official withdrawal form.)

Students who have paid their tuition in full and who withdraw from courses or from the College will receive a refund of tuition, upon written request to the Comptroller's Office, according to the following schedule:

## Time of withdrawal <br> First two weeks

Tuition Refund
Third and fourth weeks
Fifth week
80\%
After fifth week
40\%
no refund
Weekend College students who have paid their tuition in full and who withdraw from Weekend College classes will receive a refund of one-half of their tuition through the second weekend of classes, upon written request to the Comptroller's Office classes, upon writh request to the Comploller's Office within this period.
Fees are non-refundable. No student who is suspended or expelled shall be entitled to any refund.

For further information, write or call:

## Barbara E. King, Director

Evening, Summer and Weekend College
Wilkes College
Chase Hall, 184 South River Street
Wilkes-Barre, Pennsylvania 18766
Phone: (717) 824-4651, Ext. 380
Toll-free: from Scranton, Pennsylvania 342-5617
from elsewhere in Pennsylvania (800) 572-4444
from outside of Pennsylvania [Middle-Atlantic and from outside of Pennsylvania [Middie-

REGISTRATION
Wednesday, January 13
Thursday, January 14 . .
LOCATION
Evening, Summer and Weekend College
Chase Hall, Second Floor
STUDY SKILLL WORKSHOPS
(Evening Sessions)

- How to Schedule Your Time for Efficient Studying - How to Take Objective and Essay Tests.
- How to Take Notes from a Lecture and Read a Textbook. Ms. Judy Fremont, Learning Center, 824-4651 Ext. 477

EVENING COLLEGE CLASSES

$$
\text { January } 20 \text { - May 14, } 1988
$$

(TIMES IN LIGHT FACE REPRESENT A.M. and TIMES IN BOLD FACE P.M.)

## EARLY REGISTRATION

## WILL BE ACCEPTED

## 8:30 A.M. - 4:30 P.M.

AFTER DECEMBER 1, 1987

| Course | Description | Room | Day \& Hour C | Credits |
| :---: | :---: | :---: | :---: | :---: |
| ENG 152 E 1 | Western World Literature II (Prereq: ENG 151) | SLC 1 | M 6:30-9:15 | 3 |
| ENG 152 E2 | Western World Literature II (Prereq: ENG 151) | SLC 334 | T 6:30-9:15 | 3 |
| ENG 301 E | Literary Criticism (Prereq: ENG 152 or 254) | KBY 302 | Th 6:00-9:00 | 3 |
| ENG 312 E | Chaucer <br> (Prereq: ENG 152 or 254) | SLC 347 | T 6:00-9:00 | 3 |
| ENG 397 E | Seminar <br> (Prereq: Approval of department chairman is required) | KBY 302 | W 6:00-9:00 | 3 |
| FOREIGN LANGUAGES: |  |  |  |  |
| Chinese 101 E | Elementary Chinese | TBA | TTh 7:00-8:15 | 3 |
| French 102 E | Elementary French II (Prereq: Permission of instructor) | TBA | T Th 6:00-7:15 | 3 |
| German 102 E | Elementary German II (Prereq: Permission of instructor) | TBA | T Th 7:00-8:15 | 3 |
| Hebrew 101 E | Elementary Hebrew | TBA | M W 7:00-8:15 | 3 |
| Italian 102 E | Elementary Italian II (Prereq: Permission of instructor) | TBA | TTh 6:00-7:15 | 3 |
| Latin 101 E | Elementary Latin | TBA | M W 7:00-8:15 | 3 |
| Russian 102 E | Elementary Russian II (Prereq: Permission of instructor) | TBA | T Th 7:00-8:15 | 3 |
| Spanish 101 E | Elementary Spanish | TBA | TTh 7:00-8:15 | 3 |
| HISTORY: |  |  |  |  |
| HST 101 E | World Civilization I | SLC 270 | W 6:30-9:15 | 3 |
| HST 102 E | World Civilization II | SLC 318 | T 6:30-9:15 | 3 |
| HST 333 E | The Age of Big Business | Capin 15 | M 6:30-9:15 | 3 |
| MATHEMATICS: |  |  |  |  |
| MTH 102 E | Fundamentals of Math II (Prerea: MTH 101) | SLC 405 | M W 8:00-9:15 | 3 |
| MTH 111 E | Calculus I <br> (Prereq: MTH 100 or at least three years of secondary mathematics including Geometry, Algebra II, and topics | $\begin{aligned} & \text { SLC } 405 \\ & \text { school } \\ & \text { sin Trigonomett } \end{aligned}$ | T Th 6:30-8:15 | 4 |
| MTH 112 E | Calculus II | SLC 411 | M W 6:30-8:15 | 4 |
| MTH 212 E | Multivariable Calculus (Prereq: MTH 112) | SLC 411 | M W 6:30-8:15 | 4 |
| MUSIC: |  |  |  |  |
| MUS 101 E | Introduction to Music I | DDD 218 | T 6:30-9:15 | 3 |
| NURSING: <br> NSG 204 E | Nursing Care Adult Client II | SLC 359 | M W 6:30-9:15 | 8 |

WEEKEND COLLEGE CLASSES Spring, 1988
on the campus of Keystone Junior College La Plume, Pennsylvania January 8 - April 17, 1988
Calendar - Spring, 1988




[^0]:    'Mit 101 and 102 or a higher sequence required of all accounting majors.

[^1]:    1

[^2]:    EC 198/298/398. TOPICS
    Lectures on current issues and developments in economics.

[^3]:    EE electives may be chosen from any mathematics, science, or engineering course numbered 200 or above, with
    Ee electives may be chosen from any mathematics, science, or engineering course numbered 200 or above, with Power Communication Students desiring computer, bioengineering, or other concentrations should consult their ad ssor tor proper EE electives.
    Thera Studies constitute a total of nine credits in the humanities and nine in the social sciences

[^4]:    See various departmental sections of the Bulletin for course descriptions.

[^5]:    These courses are required for all International Studies Majors.
    may elect to star their junior year on campus Courses will be selected in consultation with the Interna

[^6]:    -Pulic pertormance required

[^7]:    Cre Requirements - Compuler science courses may be substituted for the last two semesters of language with the
    coud it the Academic Standards Committee. coord of the Academic Standards Committee.
    mathematics, science, or engineering courses numbered 200 or above.

