Supplement Vol. 6, No. 1 Sequence 14

BULLETIN SUPPLEMENT

Course Descriptions

January-1974

THIS BOOKLET SUPERSEDES THE LISTING
SHOWN IN THE 1973 - 1974 BULLETIN

For Spring Quarter Only, Use 73 - 74 Bulletin For:

1. All Accounting Courses
2. IEMS 324
3. MGMT 301 will not become a 3 hr. course usable under the Advanced Program until Summer Quarter.

COURSE DESCRIPTIONS

CLASSIFICATION OF COURSES

The University course numbering system is as follows:

100-299 are freshman and sophomore level courses and are designed primarily for these students.

300-499 are junior and senior level courses and are designed primarily for these and other advanced students. When approved for inclusion in an individual program of graduate study by a supervisory committee approved by the Dean of Graduate Studies, selected 400-499 courses may serve the needs of individual graduate students.

500-599 are *beginning graduate and advanced undergraduate* level courses – open to graduate students and those seniors who receive approval of the appropriate Dean(s).

600-699 are *beginning graduate and professional* level courses open only to graduate students.

SPECIAL COURSES

In addition to the regular courses listed in this bulletin, the following special courses may be available. Consult your academic advisor for details.

	Undergraduates		Special Grad[1]	Grad & Prof
	300	400	500	600
Special Topics	391	491	591	691
Seminar	392	492	592	692
Special Readings	393	493	593	693
Independent Study	394	494	594	694
Research Methods		495	595	695
Research Planning		496	596	696
Research		497	597	697
Research Report		498	598	698
Thesis		499		699

These courses may be assigned variable credit. Some may be repeated upon approval.

PR: PREREQUISITE

A course in which credit must be earned prior to enrollment in the listed course.

CR: COREQUISITE

A course which must be taken concurrently with or prior to the listed course.

C.I.: CONSENT OF INSTRUCTOR

HOURS CODE

Each course listing is followed by a code which shows hours credit, contact hours, and quarters during which the course will normally be offered.

Example:

GEOL 201 4 (2, 4) W
Physical Geography

Geology 201 carries four hours credit but requires six contact hours: two in class and four in laboratory or field work. It is scheduled to be offered in the Winter Quarter.

Quarter designation; F = Fall; W = Winter; S = Spring; Su = Summer.

AVAILABILITY OF COURSES

The University does not offer all of the courses listed in the catalog each year. The Class Schedule should be consulted for those courses offered each quarter.

ENVIRONMENTAL STUDIES PROGRAM

ENVIRONMENTAL STUDIES (69)

BASIC PROGRAM (54)

COMMUNICATIONS 10

Composition
- ENG 101 Composition I (4)

Speech
- SPE 101 Fundamentals of Oral Communication (3)

Communications Options
- Current Literature, English, writing course or Speech Course

CULTURAL AND HISTORICAL FOUNDATIONS* 11-12
(Select one course from each group)

I.	HUM 201	Western Humanities Survey (4)
II.	ART	Art (3)
		Any Literature (3)
	HIST	History (4)
	HUM	Humanities (4)
	MUS	Music
	PHIL	Philosophy (4)
	REL	Religion (4)
	THA	Theatre (4)
III.	HIST	History (4)

MATHEMATICAL SCIENCES 7-8
(Select any two)

MATH	Mathematics (4)
STAT	Statistics (4)
COMP	Computer Science (1-4)
PHI 205	Formal Logic I (4)

* After the completion of a year of foreign language, a student may substitute language for any 4 hours of credit in Cultural and Historical Foundations and 4 hours of credit in Social Sciences. The remaining hours may be used in the General Elective Area of the students' major.

SOCIAL SCIENCES* 12-13
(Select from both I & II)

I.	ECON 201, 202 or 203	Economics (3, 3)
	PCL 201 or 303	Political Science (4)
	GEO 350 or 360	Social Geography
II.	PSY 201, 202	Psychology (4, 4)
	SOC 201, 202	Sociology (4, 4)
	SOC 310, 311	Anthropology (4, 4)
	COM 100	Basic Communications (3)

SCIENTIFIC ENVIRONMENT 11-13
(Select from at least two groups)

I. Biological Science (4-8)
- Any BIOL, BOT, MICRO or ZOOL Course

II. Earth Sciences (4-8)
- GEOL 100, 201, 202
- GEOG 100, 301

III. Physical Sciences (4-8)
- Any Physics courses
- Any Chemistry courses
- ENGR 100, 151, 152

ADVANCED PROGRAM (15)

BUSINESS (3)
- BADM 301, 302, 371
- ECON 307

ENGINEERING (3)
- ENGR 480 to 489

EDUCATION (3)
- EDEL 482 (3)
- EDTA 480 (3)
- EDTA 481 (3)
- EDLS 308 (3)
- EDPE 483 (3)

ELECTIVES (Upper Division) (6)

Theses courses must be selected from a college other than the one in which the student is registered. A General Studies student may select electives from any college.

A

ACCOUNTANCY

***For Spring Quarter Only — Use 73-74 Bulletin**

ACCY 211 Qtr. Hrs. - 3 (3,0)
Financial Accounting 1: Accounting concepts, financial statements, accounting cycle, monetary and fixed assets, inventories, current and long-term liabilities, equity structure of proprietorships, partnerships, corporations.

ACCY 212 Qtr. Hrs. - 3(3,0)
Financial Accounting II: Accounting concepts, financial statements, accounting cycle, monetary and fixed assets, inventories, current and long-term liabilities, equity structure of proprietorships, partnerships, corporations.

ACCY 300 Qtr. Hrs. - 5(5,0)
Financial Accounting: PR: Junior standing. Accounting concepts, financial statements, accounting cycle, monetory and fixed assets, inventories, current and long-term liabilities, equity structure of proprietorships, partnerships, corporations. An accelerated course. Credit may not be earned in both ACCY 300 and the ACCY 211, 212 sequence.

~~ACCY 307~~ Qtr. Hrs. - ~~5 (5,0)~~
~~Accounting Concepts: PR: Junior standing. (Not open to accountancy majors.) Emphasis is on internal reports for managerial planning and control and on financial statements for interested parties external to the business organization. Credit may not be earned in both ACCY 307 and the ACCY 211, 212 sequence.~~

ACCY 310 Qtr. Hrs. - 5 (5,0)
Systems Concepts and Management Accounting: PR: ACCY 212 or ACCY 300 or equivalent. General information systems theory, business financial information requirements; economic information for business functions; cost accounting concepts and relationships, forecasting and budgeting.

ACCY 311 Qtr. Hrs. - 5 (5,0)
Intermediate Accounting: PR: ACCY 212, 300, or equivalent. An in-depth study of assets, liabilities, and stockholders' equity. Income determination; tax implications; funds flow; mathematical principles and application; professional pronouncements.

ACCY 312 Qtr. Hrs. - 5 (5,0)
Intermediate Accounting: PR: ACCY 311. A continuation of ACCY 311.

ACCY 320 Qtr. Hrs. - 5 (5,0)
Cost Accounting: PR: ACCY 310. Concepts of cost behavior; cost accounting principles; cost concepts for special decisions; cost measurement for business income.

ACCY 322 Qtr. Hrs. - 3 (3,0)
Cost Accounting: PR: ACCY 321. The development of cost accounting. Its purposes and its shortcomings. Coordination of cost accounting with general accounting records. Methods of cost analysis and cost application.

ACCY 410 Qtr. Hrs. - 5 (5,0)
Advanced Accounting: PR: ACCY 312. Problems of partnerships, business combinations, consolidated statements. Fund accounting principles and procedures and their relation to governmental accounting.

ACCY 411 Qtr. Hrs. - 3 (3,0)
Advanced Accounting: PR: ACCY 312. Complex cases in partnership formation, operation, expansion, and liquidation. Installment sales; consignments; home and branch relationships; mathematics of compound interest.

ACCY 412 Qtr. Hrs. - 3 (3,0)
Advanced Accounting: PR: ACCY 312 or C.I. Business combinations; acquisition of subsidiaries; investment carried at equity and cost methods. Advanced problems of consolidated statement preparation. Foreign branches.

ACCY 413 Qtr. Hrs. - 3 (3,0)
Advanced Accounting: PR: ACCY 312 or C.I. Cases of enterprises in distress; estates and trusts. Also a study of the general and special funds related to municipal accounting and non-profit organizations.

ACCY 430 Qtr. Hrs. - 5 (5,0)
Auditing: PR: ACCY 312. The principles, practices and procedures followed in the audit function. Preparation of related working papers and the audit report.

ACCY 434 Qtr. Hrs. - 3 (3,0)
Auditing II: PR: C. I. A further examination of current auditing practices and procedures, including statistical sampling. Preparation of audit reports.

ACCY 450 Qtr. Hrs. - 5 (5,0)
Federal Income Tax Accounting: Concepts and methods of determining taxable income of individuals, partnerships and corporations.

ACCY 452 Qtr. Hrs. - 3 (3,0)
Federal Income Tax Accounting: PR: C. I. Corporation tax returns. Study of accounting methods acceptable for tax purposes. Study of federal income tax procedures and appeals methods.

ACCY 461 Qtr. Hrs. - 3 (3,0)
Computer Applications to Accounting Problems: PR: COMP 103 and ACCY 312. The purpose of the computer in financial management. Its use as part of the accounting process. Place of the computer in present day accounting, budgeting and auditing matters.

ACCY 470 Qtr. Hrs. - 3 (3,0)
Current Selected Topics: PR: ACCY 312, 320 and Senior standing. An examination and discussion of current changes and controversial topics in financial reporting.

ACCY 501 Qtr. Hrs. - 4 (4,0)
Financial Accounting Concepts: PR: Acceptance into the MBA Program. The conceptual background for financial statements for external purposes including problems of the accounting period, the accrual concepts and changing price levels, etc.

ACCY 601 Qtr. Hrs. - 3 (3,0)
Accounting Analysis: PR: Graduate standing and ACCY 501 or one year of accounting. (Not open for accounting majors.) Accounting as an information and measurement system for internal planning and control; concepts and analytical techniques for accumulating costs of products and services.

AIR FORCE ROTC

AFR 101 Qtr. Hrs. - 1 (1,1)
The United States Air Force and Strategic Offensive Forces: PR: Qualification for Air Force ROTC or permission of Professor of Aerospace Studies. History, mission, organization and doctrine of the United States Air Force and a study of U.S. Strategic Offensive Forces.

AFR 102 Qtr. Hrs. - 1 (1,1)
Strategic Defense Forces: PR: AFR 101 or permission of Professor of Aerospace Studies. Concepts of aerospace defense. A study of the various systems and functions associated with defense against manned bombers and missiles.

AFR 103 Qtr. Hrs. - 1 (1,1)
Strategic Defense Forces: PR: AFR 102 or permission of Professor of Aerospace Studies. A brief review of Army, Navy, and Marine Forces. An introduction to special operations and countersurgency.

AFR 201 Qtr. Hrs. - 1 (1,1)
The Birth of Airpower: PR: AFR 103 or approval of PAS. A study of the early development of manned flight from the 18th century balloonist through the achievement of mature airpower capabilities prior to World War II.

AFR 202 Qtr. Hrs. - 1 (1,1)
Airpower: Crisis and Maturity: PR: AFR 201 or approval of PAS. A review of fifteen years of airpower development, highlighting changes in aircraft technology and employment brought about by experiences in WWII and Korea.

AFR 203 Qtr. Hrs. - 1 (1,1)
The Aerospace Age: PR: AFR 202 or approval of PAS. A study of aerospace power in the contemporary world and its current employment as a force of stability.

AFR 301 Qtr. Hrs. - 3 (3,1)
Military Role in Contemporary Society: PR GMC or two-year program selection and/or approval of PAS. Review and survey of military communicative skills. Examination of broad range of American civil-military relations.

AFR 302 Qtr. Hrs. - 3 (3,1)
Defense Policy and Strategy: PR: AFR 301 or approval of PAS. A study of the framework of defense policy and formation of defense strategy including political, economic and social constraints upon the national defense structure.

AFR 303 Qtr. Hrs. - 3 (3,1)
Implementation of Defense Policy: PR: AFR 302 or approval of PAS. An examination of defense implementation by the DOD, Congress and the Presidency and a survey of officer classification and assignments.

AFR 401 Qtr. Hrs. - 3 (3,1)
Leadership and Discipline in the Air Force: PR: AFR 303 or approval of Professor of Aerospace Studies. The need for Air Force leadership, professional responsibilities of the officer, need for discipline in the military, and the military justice system.

AFR 402 Qtr. Hrs. - 3 (3,1)
Principles of Military Leadership and Management: PR: AFR 401 or approval of Professor of Aerospace Studies. Variables affecting military leadership, traits and interactional approaches to leadership, introduction to military management, and systems approach to Air Force management.

AFR 403 Qtr. Hrs. - 3 (3,1)
Air Force Management and the Junior Officer: PR: AFR 402 or approval of Professor of Aerospace Studies. Pertinent Air Force publications and personnel management policies, as they affect the junior officer. Preparation of each cadet for active duty.

AFR 404 Qtr. Hrs. - 4 (4,0)
Introduction to Flight (Pilot): PR: AFR 301, 302, 303 and/or permission of the Professor of Aerospace Studies. An academic introductory study of weather, navigation, FAA regulations and flight radio procedures.

ALLIED HEALTH SCIENCES

AHS 305 Qtr. Hrs. - 5 (5,0)
Medical Terminology: A study of the language of medicine and allied health specialties, including word construction, definitions and application of terms.

AHS 320 Qtr. Hrs. - 3 (3,0)
Health Services Organization: PR: MGMT 301 or C.I. Health services organizational structure; departmental procedures; interdepartmental relationships.

AHS 330 Qtr. Hrs. - 3 (3,0)
Interpretation of Clinical Tests: PR: CHEM 113 and ZOOL 334, or C.I. Introducation to laboratory tests and their evaluation; emphasis will be on tests relating to gas transport and enzymology.

AHS 350 Qtr. Hrs. - 3 (3,0)
Health Law: Principles of law as applied to the health field with special reference to health practices.

AHS 440 Qtr. Hrs. - 4 (4,0)
Fundamentals of Medicine I: PR: ZOOL 324; or ZOOL 334 and ZOOL 335; or C.I. A study of the nature, cause and treatment of specific disease entities.

AHS 441 Qtr. Hrs. - 4 (4,0)
Fundamentals of Medicine II: PR: AHS 440 or C.I. A continuation of AHS 440.

AHS 420 Qtr. Hrs. - 3 (2,2)
Supervisory Management for Health Services Agencies: PR: AHS 320, or C.I. Budgeting; equipment analyses; inservice education; office environmental factors; department layouts; job descriptions; policy and procedure manuals; staffing; schduling; labor unions.

ART

ART 201 Qtr. Hrs. - 3 (0,6)
Design Fundamentals I: Materials, processes, form. Application to product design, communication design, environmental design, and the visual arts. Stresses the value of planning and design in the development of a more humane civilization. Emphasis on two-dimensional design problems.

ART 202 Qtr. Hrs. - 3 (0,6)
Design Fundamentals II: Continuation of ART 201. Emphasis on color theory.

ART 203 Qtr. Hrs. - 3 (0,6)
Design Fundamentals III: Continuation of ART 202. Emphasis on three-dimensional design in the various sculptural media.

ART 204 Qtr. Hrs. - 3 (0,6)
Film Design: A series of exercises in craft, technique, and design for the film, including animation.

ART 211 Qtr. Hrs. - 3 (0,6)
Drawing Fundamentals I: Drawing as a means of formal organization. Introduction to problems in drawing methods and media. Emphasis on descriptive techniques.

ART 212 Qtr. Hrs. - 3 (0,6)
Drawing Fundamentals II: Continuation of ART 211. Emphasis on traditions of spatial organization.

ART 221 Qtr. Hrs. - 3 (3,0)
The History of Art I: Painting, sculpture, and architecture from the Prehistoric Era through the Medieval Period.

ART 222 Qtr. Hrs. - 3 (3,0)
The History of Art II: Painting, sculpture, and architecture from the Renaissance to the 19th Century.

ART 223 Qtr. Hrs. - 3 (3,0)
The History of Art III: Painting, sculpture, and architecture of the 19th and 20th Centuries.

ART 231 Qtr. Hrs. - 4 (2,4)
Visual Arts Overview: An analysis of the characteristics and scope of visual arts. Recommended for credit toward the cultural and historical foundations section of the Environmental Studies Program.

ART 301 Qtr. Hrs. - 3 (2,4)
Lettering: PR: Six hours of Design Fundamentals or C. I. Workshop study of the classical and historic types and styles.

ART 302 Qtr. Hrs. - 3 (2,4)
Graphic Design I: PR: Six hours Design Fundamentals and ART 301, or C.I. Principles of visual communication, methods, materials, and processes. Relationship of perceptual studies to graphic design.

ART 303 Qtr. Hrs. - 3 (2,4)
Graphic Design II: PR: ART 302 or C.I. Development of studio techniques and problems stressing balance between articulation and succinct presentation of information.

ART 304 Qtr. Hrs. - 3 (2,4)
Design In Advertising: PR: ART 201. Principles and techniques relating to field of advertising. Not open to art majors. Intended for visual arts education majors and general university elective.

ART 305 Qtr. Hrs. - 3 (0,6)
Three-Dimensional Design: PR: ART 203 or C.I. Intermediate problems in three-dimensional materials, processes, forms.

ART 308 Qtr. Hrs. - 3 (0,6)
Jewelry Design: PR: Consent of the instructor.

ART 311 Qtr. Hrs. - 3 (0,6)
Intermediate Drawing: PR: Six quarter hours of Drawing Fundamentals or C.I. Intermediate problems in drawing. Emphasis on the human form.

ART 321 Qtr. Hrs. - 3 (3,0)
Arts of Pre-Literate Societies: The visual arts in recent and contemporary primitive societies with emphasis on the cultures of Africa and Oceania.

ART 322 Qtr. Hrs. - 3 (3,0)
Asian Art: An introduction to the history of visual arts of China, Japan, India and other Eastern cultures.

ART 324 Qtr. Hrs. - 3 (3,0)
History of Photography: The development of still photography in terms of its historical, aesthetic, and social impact on Western Culture from 1839 to the present.

B

BIOLOGY

BIOL 103 Qtr. Hrs. - 4 (3,2)
Biological Principles: A study of various biological factors which affect the health and survival of man in modern society. Meets ESP requirements; designed for non-majors.

BIOL 110 Qtr. Hrs. - 5 (4,2)
Basic Biology: Basic principles, unifying concepts and facts of modern biology. Introduction to quantitative biological experimentation. For Biological Sciences, Allied Health Sciences and preprofessional majors.

BIOL 105 Qtr. Hrs. - 4 (3,3)
Biology and Environment: PR: BIOL 110 or BIOL 103. Biological implications of the interaction among human society, population, and technology in relation to the environment and natural systems. Designed for non-majors.

BIOL 332 Qtr. Hrs. - 5 (3,6)
Cell Physiology: PR: 11 hours in biological sciences or C.I. CR: CHEM 323. Basic physiological processes, cellular organization, exchange of materials, conversion of energy, irritability and contractibility.

BIOL 350 Qtr. Hrs. 4 (3,3)
Principles of Ecology: PR: 12 hours in biological sciences. Elements of ecosystems, biogeochemical cycling, environmental factor interactions, population dynamics and evolution, communities, and succession.

BIOL 360 Qtr. Hrs. - 4 (3,3)
Genetics: PR: BIOL 110. Basic principles of heredity as applied to plants and animals. Laboratory will emphasize work with *Drosophila.*

BIOL 363 Qtr. Hrs. - 4 (3,2)
Genetics and Man: PR: BIOL 103 or 110. Basic principles of genetics as illustrated by human heredity. Designed for non-majors.

BIOL 375 Qtr. Hrs. - 5 (3,6)
Biology of Marine Organisms: PR: 8 hours in biological sciences. A study of marine organisms and the interrelationships with their environment. Weekend field trips required.

BIOL 410 Qtr. Hrs. - 5 (3,6)
Microtechnique: PR: 1 yr. Biological Science. Preparation of plant and animal tissue for microscopic study; embedding; use of various microtomes; staining procedures; whole mounts.

BIOL 450 Qtr. Hrs. - 5 (3,6)
Limnology: PR: BIOL 350 or C.I. Introduction to principles of limnology and methods for freshwater ecology with respect to physical, chemical and biological parameters.

BIOL 451 Qtr. Hrs. - 5 (3,6)
Freshwater Systems: PR: BIOL 450 or C.I. Primary and secondary productivity and interaction among factors such as nutrients, pollutants, temperature radiation, turbidity, and seasons.

BIOL 460 Qtr. Hrs. - 3 (3,0)
Organic Evolution: PR: 11 hours in biological sciences including BIOL 360. An outline of evolutionary principles, natural selection and phylogeny; origin of variation and origin of species.

BIOL 470 Qtr. Hrs. - 3 (3,0)
History of Biology: PR: Junior standing. People and events from Aristotelian times to the present; development of the science of biology.

BIOL 519 Qtr. Hrs. - 5 (2,6)
Experimental Methods for Organismic Biology: PR: BIOL 332 or MICR 430; CHEM 325 and 444. Biochemical and biophysical techniques applied to extraction, purification and characterization of biological materials.

BIOL 520 Qtr. Hrs. - 4 (3,3)
Cell Biology: PR: 11 hours in biological sciences and CHEM 323. Biological organization and function at the cellular-organelle level.

BIOL 553 Qtr. Hrs. - 5 (3,6)
Population Ecology: PR: Ecology, statistics and 2 years biological science. Population as an ecological unit with emphasis on growth, regulation, dynamics, competitive interactions and predation.

BIOL 554 Qtr. Hrs. - 5 (3,6)
Ecology of Running Water: PR: BIOL 450 or C.I. Biological adaptations and communities in relation to channel formation, flow dynamics, and physico-chemical aspects of running waters.

BIOL 560 Qtr. Hrs. - 5 (3,6)
Cytogenetics: PR: BIOL 360 or C.I. Chromosomal coarse and fine structure, biochemistry, and behavior as related to genetics and evolutionary mechanisms.

BIOL 564 Qtr. Hrs. - 5 (3,6)
Population Genetics: PR: 360, 460; Statistics; or C.I. Mathematical evaluation of Mendelian populations; gene frequency and interaction influence on mutation, selection, migration and genetic drift.

BIOL 654 Qtr. Hrs. - 5 (3,6)
Ecology of Running Water: PR: BIOL 450 or C.I. Biological adaptations and communities in relation to channel formation, flow dynamics, and physico-chemical aspects of running waters.

BIOL 655 Qtr. Hrs. - 5 (3,6)
Experimental Ecology: PR: BIOL 350 and C.I. Determination and evaluation of physiological or behavioral attributes which determine interactions among organisms within an ecosystem.

BIOL 675 Qtr. Hrs. - 4 (4,0)
Contemporary Studies in Environmental Biology: PR: Graduate standing. Analysis of current publications and developments in science and technology applicable to environmental problems.

BOTANY

BOT 100 Qtr. Hrs. - 4 (2,4)
General Botany: PR: BIOL 103 or BIOL 110. Introduction to botany; plant structure and function, including a survey of the plant kingdom giving special emphasis to forms important to man.

BOT 320 Qtr. Hrs. - 5 (3,6)
Comparative Morphology of Plants: PR: BOT 100. A sequential survey of the algae, fungi, bryophytes, ferns, fern allies, gymnosperms and flowering plants, with emphasis on evolutionary relationships, structure and function.

BOT 325 Qtr. Hrs. - 4 (3,3)
Plant Anatomy: PR: BOT 100. A study of the development, structure and function of the principle organs and tissues of vascular plants.

BOT 330 Qtr. Hrs. - 5 (3,6)
Plant Physiology: PR: BIOL 332 or C.I. A study of the mechanisms used by plants to cope with their environment.

BOT 345 Qtr. Hrs. - 5 (3,6)
Plant Taxonomy: PR: BOT 100. An introduction to systematics, classification and identification of vascular plants with emphasis on the flora of peninsular Florida.

BOT 371 Qtr. Hrs. - 3 (3,0)
Plants and Man - Ethnobotany: Man's historical and modern uses of plants economically important in various cultures. Designed for non-majors.

BOT 372 Qtr. Hrs. - 3 (3,0)
Plants and the Urban Environment: The selection, placement, propagation and care of ornamental plants in residential, commercial and industrial areas. Designed for non-majors.

BOT 441 Qtr. Hrs. - 4 (3,3)
Phycology: PR: BOT 320 or C.I. A lecture-laboratory course to survey the diversity and classification of marine, terrestrial and freshwater algae.

BOT 443 Qtr. Hrs. - 4 (2,6)
Mycology: PR: BOT 320 or MICR 200 or C.I. A lecture-laboratory course to cover the major groups of fungi, treating their morphology and classification and emphasizing those of special importance to man.

BOT 451 Qtr. Hrs. - 4 (3,3)
Community Ecology: PR: BIOL 350 or C.I. The role of soils, climate, organisms and succession in the composition of diverse plant communities.

ART 341 Qtr. Hrs. - 3
Photography: Consideration of basic technical and aesthetic factors in using still photography as a vehicle for visual, artistic expression.

ART 342 Qtr. Hrs. - 4 (3,3)
Cinematography: PR: ART 204 or C.I. Consideration of basic technical and aesthetic factors involved in using motion pictures as a vehicle for visual, artistic expression.

ART 351 Qtr. Hrs. - 3 (0,6)
Painting: PR: Three quarter hours in Design Fundamentals and three quarter hours in Drawing Fundamentals or C.I.

ART 361 Qtr. Hrs. - 3 (0,6)
Printmaking: PR: Three quarter hours of Drawing Fundamentals or C.I. Basic procedure and processes in printmaking. Formal and expressive characteristics of the print media.

ART 371 Qtr. Hrs. - 3 (0,6)
Sculpture: PR: Six quarters in Design Fundamentals, to include three quarter hours in three-dimensional work, or C.I.

ART 381 Qtr. Hrs. - 3 (0,6)
Ceramics: PR: ART 203 or C.I. Basic concepts of ceramic design, experience in processes of forming, decorating, glazing, and firing pottery.

ART 391 Qtr. Hrs. - 3 (0,6)
Experiments in Art and Technology: PR: Consent of Instructor.

ART 402 Qtr. Hrs. - 3 (2,4)
Advanced Graphic Design I: PR: ART 301, ART 302, ART 303. Advanced study in typographic organization, paper, and light-sensitive materials related to design and production of a book.

ART 403 Qtr. Hrs. - 3 (2,4)
Advanced Graphic Design II: PR: ART 402. Relatively large scale problems in existing media of graphic application. Pictorial and symbolic expression in creation of poster design, symbols, magazine and book cover design.

ART 404 Qtr. Hrs. - 3 (2,4)
Advanced Graphic Design III: PR: ART 403. Workshop in Graphic Design: Individual problems providing students with an opportunity to initiate search for an independent formula of graphic design principles.

ART 405 Qtr. Hrs. - 3 (0,6)
Advanced Three-Dimensional Design: PR: ART 305. May be repeated for credit. Advanced problems in three-dimensional materials, processes, form.

ART 408 Qtr. Hrs. - 3 (0,6)
Advanced Jewelry Design: PR: ART 308. May be repeated for credit.

ART 409 Qtr. Hrs. - 3 (0,6)
Fibers, Fabrics, Textiles and Synthetics: Textile design and production, including non-loom and loom weaving processes.

ART 410 Qtr. Hrs. - 3 (0,6)
Metals, Woods, Leathers and Stones: Processes and techniques of production in these traditional craft materials.

ART 411 Qtr. Hrs. - 3 (0,6)
Advanced Drawing: PR: ART 311. May be repeated for credit.

ART 421 Qtr. Hrs. - 4 (3,3)
Purposes of Art: An Analysis and Appreciation of the visual arts in terms of their various purposes.

ART 425 Qtr. Hrs. - 4 (4,0)
Religious Symbolism in the Visual Arts: A study of the origin, migration, and transmutation of religious signs, symbols and images in the history of art. (Same as HUM 425.)

ART 431 Qtr. Hrs. - 4 (3,3)
Developing Visual Creativity: Analysis of the nature of the creative faculties and the development of creativity through visual processes.

ART 433 Qtr. Hrs. - 3 (3,0)
Theory and Criticism of the Visual Arts: Criteria of criticism; analysis of works of art; elements of psychology and sociology of art; semantics of critical terminology; relation of aesthetic meaning to reality and truth; emphasis on developments in the arts of the 20th Century.

ART 434 Qtr. Hrs. - 3 (3,0)
Art and Technology: The impact of technological developments in the visual arts of the 20th Century.

ART 435 Qtr. Hrs. - 4 (4,0)
Environmental Art: Analysis of aesthetic design factors, related to city planning, architecture, product design, and experimental environmental arts.

ART 441 Qtr. Hrs. - 3 (0,6)
Advanced Photography: PR: ART 341. May be repeated for credit.

ART ~~422~~ 442 Qtr. Hrs. - (3,3)
Advanced Cinematography: PR: ART 342. May be repeated for credit.

ART 443 Qtr. Hrs. - 4 (3,3)
Special Problems in Photography: PR: ART 341 or C.I. A series of directed photographic problems of a research nature. May be repeated for credit.

ART 451 Qtr. Hrs. - 3 (0,6)
Advanced Painting: PR: ART 351. May be repeated for credit.

ART 461 Qtr. Hrs. - 3 (0,6)
Advanced Printmaking: PR: ART 361. May be repeated for credit.

ART 471 Qtr. Hrs. - 3 (0,6)
Advanced Sculpture: PR: ART 371. May be repeated for credit.

ART 481 Qtr. Hrs. - 3 (0,6)
Advanced Ceramics: PR: ART 381. May be repeated for credit.

ART 482 Qtr. Hrs. - 3 (0,6)
Advanced Experiments in Art and Technology: PR: ART 391. May be repeated for credit.

ART 484 Qtr. Hrs. - 3 (0,6)
Senior Studio and Exhibition: PR: Senior Standing and consent of the studio area's faculty. Required of all art majors with a studio concentration.

BOT 453 Qtr. Hrs. - 3 (3,0)
Plant Geography: PR: BIOL 350, BOT 451 or C.I. The major climatic plant formations of the world and historical plant geography.

BOT 522 Qtr. Hrs. - 5 (3,6)
Eumycota: Higher Fungi: PR: BOT 443 or C.I. Biology, morphology, and taxonomy of the Ascomycetes, Deuteromycetes, and Basidiomycetes.

BOT 542 Qtr. Hrs. - 4 (3,3)
Bryology: PR: BOT 320 or C.I. A lecture-laboratory survey course on the diversity and classification of mosses, liverworts and hornworts with special emphasis on those found in Florida.

BOT 547 Qtr. Hrs. - 4 (3,3)
Field Botany: PR: 12 hours in biological sciences or science teaching experience or C.I. Classification and identification among lower and higher plant groups with emphasis on field experience. Major reference sources reviewed.

BOT 549 Qtr. Hrs. - 5 (3,6)
Plant Biosystematics: PR: BOT 345 or 547. Studies of evolutionary relationships among plant taxa and populations utilizing cytological, morphological, and biochemical techniques.

BOT 671 Qtr. Hrs. - 4 (4,0)
Contemporary Studies in Botany: PR: Graduate standing. Analysis of current publications and developments in plant science.

BUSINESS ADMINISTRATION

BADM 271 Qtr. Hrs. - 3 (3,0)
Legal Environment of American Enterprise: PR: Sophomore standing. The legal and socio-economic environment of American enterprise.

BADM 301 Qtr. Hrs. - 3 (3,0)
Business Concepts: PR: Junior standing. The relationship of business and society. Discussion sections are devoted to developing the skill of solving organization problems. Not useable for BSBA degree credit.

BADM 302 Qtr. Hrs. - 3 (3,0)
Personal Investments: PR: Junior standing. Management of personal finance; life insurance and home ownership as investments; owning a business as an investment; income protection; investable funds; vehicles for investment; financial institutions; aids to investment; investment companies. Cannot be used for credit for BSBA degree. This course satisfies the Advanced Environmental Studies requirement.

BADM 371 Qtr. Hrs. - 3 (3,0)
Legal Environment of Business:PR: Junior standing. The presentation of law as an expanding social and political institution in the environment of the business enterprise.

BADM 372 Qtr. Hrs. - 3 (3,0)
Business Law: PR: BADM 271. Recognized commercial organizations including agencies, partnerships, corporations. An examination of each and their functions in the business world.

BADM 373 Qtr. Hrs. - 3 (3,0)
Business Law: PR: BADM 271 (BADM 372 desirable). A study of the legal concepts underlying the transfer and sale of goods and commercial paper, including an examination of the law of sales, commercial paper and secured transactions and their interaction with the commercial environment.

BADM 374 Qtr. Hrs. - 3 (3,0)
Property Law:PR: BADM 271 or C.I. Includes bailments, real and personal property, and security interests therein, insurance, suretyship and guaranty. (Same as LES 374).0)
International Business Operation: PR: Senior standing or C.I. An integration of economics and the functional areas of business focused upon the problems of managing international business operations. Ecomomic, legal, functional and administrative problems are studied through cases and literature emphasizing financial and marketing problems.

BADM 485 Qtr. Hrs. - 4 (4,0)
Business Policies: PR: Senior standing and completion of all other business core course requirements or C.I. A study of problems confronting businessmen. The student will be expected to utilize the subject matter contained in the business core courses and his major in the analysis of business problems. A written case researched by the student is required.

BADM 490 Qtr. Hrs. - 2 (2,0)
Senior Seminar: Business in Human Affairs: Business issues and problems as they relate to human affairs. This course primarily intended for the senior student, is offered as one of the Advanced Environmental Studies seminars. Not open to the student majoring in the College of Business Administration.

BADM 501 Qtr. Hrs. - 3 (3,0)
Business Environment and Business Law: PR: Acceptance into the M.B.A. Program. An analysis of the legal and socio-economic environment surrounding business practices as affected by significant State and Federal legislation and regulation.

BADM 601 Qtr. Hrs. - 3 (3,0)
Operations Research Models for Business: PR: Graduate Standing and ECON 521 or equivalent. Quantitative techniques useful for the solution of business problems. Mathematical model building to aid the decision-making process is stressed.

BADM 611 Qtr. Hrs. - 3 (3,0)
Systems Analysis for Business Problem Solving: PR: Graduate Standing and MGMT 501 or equivalent. A conceptual framework of the systems approach for analyzing business problems, related developments in systems theory and applications to business.

BADM 621 Qtr. Hrs. - 3 (3,0)
Business Policy and Responsibility: PR: Graduate Standing and all foundation courses or equivalent. Functions and responsibilities of management, motivation of the businessman and factors governing business decisions.

BADM 637 Qtr. Hrs. - 3 (3,0)
Simulation of Dynamic Systems: PR: Graduate Standing. A survey of techniques for conducting simulation experiments on digital computers. These experiments involve mathematical and logical models of a business or economics system.

C

CHEMISTRY

CHEM 101 Qtr. Hrs. - 3 (3,0)
Chemistry and Society: Descriptive approach to the understanding of the role of chemistry in human affairs. No mathematics required.

CHEM 102 Qtr. Hrs. - 4 (4,0)
Chemistry and Society: PR: CHEM 101. Continuation of CHEM 101.

CHEM 111 Qtr. Hrs. - 5 (4,2)
General Chemistry (Fundamentals): An introductory study of the fundamental concepts of chemistry, oriented toward AHS and Biology Education majors.

CHEM 112 Qtr. Hrs. - 3 (3,0)
General Chemistry (Organic): PR: CHEM 111. A survey of organic chemistry stressing its applications to our society. The chemistry of functional groups will be related to industrial and natural processes.

CHEM 113 Qtr. Hrs. - 3 (3,0)
General Chemistry (Biochemistry): PR: CHEM 112. A conceptual approach to the chemistry of living systems.

CHEM 115 Qtr. Hrs. 1 (0,3)
General Chemistry Laboratory (Organic-Biochemistry): PR: CHEM 112. An Introduction to organic and biochemical laboratory operations.

CHEM 251 Qtr. Hrs. 2 (1,3)
Analytical Fundamentals: PR; CHEM 264. Development of basic analytical skills and problem practice in stoichiometry, solution chemistry, and oxidation-reduction.

CHEM 261 Qtr. Hrs. 4 (4,0)
Chemistry Fundamentals I: PR: High School Chemistry or CHEM 111. Basic physical theory of chemical reactivity, atomic structure, chemical bonding, periodicity, stoichiometry, equilibria, thermodynamics, and kinetics.

CHEM 262 Qtr. Hrs. 3 (3,0)
Chemistry Fundamentals II: PR: CHEM 261. Continuation of CHEM 261.

CHEM 263 Qtr. Hrs. - 3 (3,0)
Chemistry Fundamentals III: PR: CHEM 262. Continuation of CHEM 262.

CHEM 264 Qtr. Hrs. - 1 (0,3)
Chemistry Fundamentals Laboratory: PR: CHEM 111 or CHEM 261. Illustration of chemical principles and introduction to the techniques of inorganic and physical chemistry.

CHEM 321 Qtr. Hrs. 4 (4,0)
Organic Chemistry I: PR: CHEM 263. Theory and applications of organic chemistry: structure, bonding, kinetics, thermodynamics, reaction mechanisms, synthesis, and stereochemistry. Structure elucidation via spectrometric techniques.

CHEM 322 Qtr. Hrs. - 3 (3,0)
Organic Chemistry II: PR: CHEM 321. Continuation of CHEM 321.

CHEM 323 Qtr. Hrs. - 3 (3,0)
Organic Chemistry III: PR: CHEM 322. Continuation of CHEM 322.

CHEM 324 Qtr. Hrs. - 2 (0,6)
Organic Laboratory Techniques I: PR: CHEM 321. An introduction to the laboratory techniques of organic chemistry including the preparation, reaction, and analysis of organic compounds.

CHEM 325 Qtr. Hrs. - 2 (0,6)
Organic Laboratory Techniques II: PR: CHEM 322 and CHEM 324. Open-end laboratory to develop synthesis, techniques and structure elucidation skills.

CHEM 351 Qtr. Hrs. - 3 (2,3)
Analytical Chemistry I: PR: CHEM 251. Lecture-Laboratory. Laboratory practice of classical and instrumental methods. Emphasis on problem solutions and choice of analytical procedure.

CHEM 352 Qtr. Hrs. - 3 (1-6)
Analytical Chemistry II: PR: CHEM 351. Continuation of CHEM 351.

CHEM 355 Qtr. Hrs. - 4 (2,6)
Clinical Chemistry: PR: CHEM 113 and CHEM 352. A lecture-laboratory course designed to develop a working knowledge of the analytical instrumental techniques in the modern medical laboratory.

CHEM 361 Qtr. Hrs. - 5 (4,2)
Physical Chemistry I: PR: CHEM 263, PHYS 212, and MATH 322. Rigorous treatment of atomic and molecular structure, thermodynamics, kinetics, and chemical bonding.

CHEM 362 Qtr. Hrs. - 3 (3,0)
Physical Chemistry II: PR: CHEM 361. Continuation of CHEM 361.

CHEM 363 Qtr. Hrs. - 3 (3,0)
Physical Chemistry III: PR: CHEM 362. Continuation of CHEM 362.

CHEM 364 Qtr. Hrs. - 2 (0,6)
Physical Chemistry Laboratory I: PR: CHEM 351 and CHEM 361. Classical as well as modern instrumental techniques coupled with computer data processing to measure physical properties and determine atomic and molecular parameters.

CHEM 365 Qtr. Hrs. - 2 (0,6)
Physical Chemistry Laboratory II: PR: CHEM 362 and CHEM 364. Continuation of CHEM 364.

CHEM 421 Qtr. Hrs. - 3 (3,0)
Advanced Organic Chemistry I: PR: CHEM 323 and CR: CHEM 362. Organic synthesis, reaction and mechanisms, and structural theory from the perspective of thermodynamics and kinetics.

CHEM 422 Qtr. Hrs. - 3 (3,0)
Advanced Organic Chemistry II: PR: CHEM 421. Continuation of CHEM 421.

CHEM 431 Qtr. Hrs. - 4 (4,0)
Inorganic Chemistry: CR; CHEM 363. A discussion of descriptive inorganic chemistry based on various bonding theories, thermodynamics and kinetics.

CHEM 441 Qtr. Hrs. - 3 (3,0)
Biochemistry I: PR: CHEM 323. A study of the composition, structure, and reactions which occur in living systems.

CHEM 442 Qtr. Hrs. - 3 (3,0)
Biochemistry II: PR: CHEM 441. Continuation of CHEM 441.

CHEM 443 Qtr. Hrs. - 3 (3,0)
Biochemistry III: PR: CHEM 422. Continuation of CHEM 442.

CHEM 444 Qtr. Hrs. - 2 (0,6)
Biochemical Methods I: PR: CHEM 113 or CHEM 441, and CHEM 352. A laboratory course stressing the application of the chemical arts to the separation, identification, and quantitation of materials of biological significance.

CHEM 445 Qtr. Hrs. - 2 (0,6)
Biochemical Methods II: PR: CHEM 444. Continuation of CHEM 444.

CHEM 451 Qtr. Hrs. - 5 (3,6)
Analytical Laboratory Technique I: PR: CHEM 323, CHEM 352, and CHEM 363. A lecture-laboratory course designed to give in-depth coverage to modern methods of analysis including electrochemistry, spectroscopy, and separation techniques.

CHEM 452 Qtr. Hrs. - 4 (2,6)
Analytical Laboratory Technique II: PR: CHEM 451. A lecture-laboratory course in which students propose and evaluate procedures for inorganic and organic analyses.

CHEM 461 Qtr. Hrs. - 3 (3,0)
Advanced Physical Chemistry: CR: CHEM 363 and PR: MATH 324. A rigorous treatment of selected topics of thermodynamics, kinetics, quantum mechanics, and structure.

CHEM 471 Qtr. Hrs. - 3 (3,0)
Introduction of Nuclear Chemistry: PR: CHEM 362. Discussion of fundamental particles, nuclear reactions, radioactivity, radiation chemistry, and isotope chemistry.

CHEM 474 Qtr. Hrs. - 3 (1,6)
Radiochemical Techniques: PR: CHEM 352. A lecture-laboratory course stressing radiochemical handling techniques, radiation safety, and the detection and measurement of nuclear radiation.

CIVIL ENGINEERING & ENVIRONMENTAL SCIENCES

CEES 321 Qtr. Hrs. - 3 (2,3)
Surveying: CR: Junior Standing. Theory and field practice in engineering measurements, and the reduction and adjustment of data.

CEES 322 Qtr. Hrs. - 4 (3,3)
Engineering and Environmental Geology: Principles of physical geology with emphasis on engineering and environmental topics. Study of land forms, geologic maps, geologic structure, weathering, groundwater, mass wasting, and earthquakes.

CEES 351 Qtr. Hrs. - 4 (3,0)
Structural Mechanics: PR: ENGR 312. Analysis of statically indeterminate structures by flexibility and stiffness methods, and energy methods. Analysis of columns. Plastic bending. Identical to EMMS 351.

CEES 411 Qtr. Hrs. - 4 (4,0)
Environmental Engineering — Water Supply: CR: ENGR 332. Water resources, hydrologic cycle, water quality, chemistry of natural water, water treatment, transmission, and distribution.

CEES 412 Qtr. Hrs. - 4 (4,0)
Environmental Engineering — Wastewater: CR: ENGR 332. Drainage systems, collection and transmission of wastewater, channel flow, biodegradation of organic wastes, principles of wastewater treatment, effluent and sludge handling and disposal.

CEES 414 Qtr. Hrs. - 3 (3,0)
Water and Wastewater Systems Design: PR: CEES 411 and 412 or C.I. Planning capacity and design of water distribution systems, sanitary sewerage, storm drainage systems, water and wastewater treatment plants.

CEES 415 Qtr. Hrs. - 3 (3,0)
Atmospheric Pollution Control: PR: Senior standing. Atmospheric composition and dynamics, sources and nature of contaminants, toxicity thresholds and biological significance, engineering methods of measurement and control.

CEES 431 Qtr. Hrs. - 4 (3,3)
Soil Mechanics and Foundation Engineering I: PR: ENGR 312. Nature of soils, classification, engineering properties, consolidation, soil strength, groundwater and seepage, compaction and stabilization.

CEES 432 Qtr. Hrs. - 4 (3,3)
Soil Mechanics and Foundation Engineering II:, PR: CEES 431. Continuation of CEES 431 with emphasis on foundations including soil investigations, earth pressures, settlements, bearing capacity, pile foundations, slope stability.

CEES 451 Qtr. Hrs. - 4 (4,0)
Matrix Methods of Structural Analysis I: PR: CEES 351 or C.I. Structural analysis of beams, frames, and plates by matrix methods. Identical to EMMS 441.

CEES 455 Qtr. Hrs. - 3 (2,2)
Structural Steel Design: PR: ENGR 312. Design of steel structural members. Selected topics in beam design, column design, plastic design, connections and build-up members. Identical to EMMS 455.

CEES 457 Qtr. Hrs. - 3 (2,2)
Structural Concrete Design: PR: ENGR 312. Principles of designing reinforced concrete members. Selected topics in concrete mixes, beams, columns, and ultimate analysis. Identical to EMMS 457.

CEES 461 Qtr. Hrs. - 3 (3,0)
Transportation Engineering: PR: ENGR 341 and 371. Investigation of all forms of transport — highway, rail, water, air. Systems approach to planning, design, construction, operation, and administration of transportation networks.

CEES 462 Qtr. Hrs. - 3 (3,0)
Transportation Engineering: PR: CEES 461. Advanced topics in transportation system analysis.

CEES 463 Qtr. Hrs. - 3 (3,0)
Traffic Engineering: PR: CEES 461 and ENGR 371. Study of operator and vehicle characteristics, street capacity, signals, signs and markings. All phases of traffic engineering as applied to urban areas.

CEES 471 Qtr. Hrs. - 3 (3,0)
Urban Planning: PR: ENGR 342. History and principles of planning. Basic economic, land use, population, conservation, and government planning concepts. Quantitative methods for comprehensive studies of urban development.

CEES 472 Qtr. Hrs. - 3 (3,0)
Urban Planning: PR: CEES 471. Municipal organization and administration, public health, public utilities, services, zoning, replanning, critical studies.

CEES 501 Qtr. Hrs. - 3 (2,3)
Environmental Engineering — Chemistry I: Study of fundamental principles of physical and analytical chemistry applicable to treatment of water and wastewater. Chemical thermodynamics, chemical kinetics, chemical equilibria, water analysis.

CEES 502 Qtr. Hrs. - 3 (2,3)
Environmental Engineering — Chemistry II: PR: CEES 501 or C.I. Continuation of CEES 501 to include study of fundamental principles of organic chemistry and biochemistry as applied to environmental quality control, biodegradation of wastes, and wastewater analysis.

CEES 503 Qtr. Hrs. - 3 (3,0)
Environmental Impact Assessment: PR: CEES 411 and 412 or C.I. Evaluating, estimating, and predicting the effects of structures, processes, and systems upon the environment and the effects of environmental changes upon human populations.

CEES 518 Qtr. Hrs. - 3 (3,0)
Hydraulic Engineering: Application of principles of fluid mechanics to engineering problems. Topics include open channel flow, flow in conduits, hydraulic machinery, reservoir planning, and other hydraulic works.

CEES 525 Qtr. Hrs. - 3 (3,0)
Advanced Topics in Engineering Geology: Geologic aspects of major civil engineering works including dams, reservoirs, urban development, transportation systems, etc.

CEES 530 Qtr. Hrs. - 3 (3,0)
Foundation Design I: Design of fundamental foundation units including spread footings, combined footings, mats, and retaining walls.

CEES 581 Qtr. Hrs. - 3 (3,0)
Water Resources Engineering: PR: C.I. Hydrology, hydraulics, pressure conduits, open channels, and uses of water. Water resources will be studied using economic analysis and operations research techniques.

CEES 582 Qtr. Hrs. - 3 (3,0)
Water Resources Economics: PR: CEES 581. General micro-economic concepts, benefits and costs from investment alternatives, external diseconomies, effluent charges, interest rates, design life, and case studies of foreign and domestic policies.

CEES 601 Qtr. Hrs. - 4 (4,0)
Unit Operations and Processes of Sanitary Engineering I: PR: CEES 411/611 and CEES 412/612. Theory and design of physical, chemical, and biological operations and processes used in sanitary engineering.

CEES 602 Qtr. Hrs. - 4 (4,0)
Unit Operations and Processes of Sanitary Engineering II: Continuation of CEES 601. Theory and design of physical, chemical, and biological operations and processes.

CEES 603 Qtr. Hrs. - 2 (1,3)
Unit Operations and Processes Laboratory: PR: CEES 502 or C.I. Laboratory exercises in physical, chemical, and biological processes.

CEES 604 Qtr. Hrs. - 3 (3,0)
Water and Wastewater Treatment Systems: PR: CEES 611 and 612 or C.I. Integration of unit operations and processes into treatment systems. Emphasis will be placed on functional, hydraulic, and economic design using computers.

CEES 611 Qtr. Hrs. - 4 (4,0)
Environmental Engineering — Water Supply: Water resources, hydrologic cycle, water quality, chemistry of natural water, water treatment, transmission, and distribution.

CEES 612 Qtr. Hrs. - 4 (4,0)
Environmental Engineering — Wastewater: Drainage systems, collection and transmission of wastewater, channel flow, biodegradation of organic wastes, principles of wastewater treatment, effluent and sludge handling and disposal.

CEES 614 Qtr. Hrs. - 3 (3,0)
Water and Wastewater Systems Design: CHEES 611 and 612 or C.I. Planning capacity and design of water distribution systems, sanitary sewerage, storm drainage systems, water and wastewater treatment plant.

CEES 615 Qtr. Hrs. - 3 (3,0)
Atmospheric Pollution Control: Atmospheric composition and dynamics, sources and nature of contaminants, toxicity thresholds and biological significance, engineering methods of measurement and control.

CEES 618 Qtr. Hrs. - 3 (3,0)
Solid Wastes Management: Study of the extent and characteristics of the solid waste problem, collection and disposal systems, and environmental interfaces and effects.

CEES 620 Qtr. Hrs. - 3 (3,0)
Groundwater and Seepage: Theories of groundwater movement, geological factors, analysis techniques, etc. Emphasis on practical considerations.

CEES 630 Qtr. Hrs. - 3 (3,0)
Foundation Design II: Continuation of topics in CEES 530 including sheet piles and pile foundations.

COMMUNICATION

COM 100 Qtr. Hrs. - 4 (4,0)
Basic Communication: Survey of basic factors affecting human interaction through communication; theories and models of communication; contributions of behavioral sciences and related arts; mass media in society.

COM 301 Qtr. Hrs. - 4 (4,0)
Communication as a Behavioral Science: Basic principles of the behavioral science approach to the study of contemporary communication.

COM 310 Qtr. Hrs. - 4 (4,0)
History of the Motion Picture: Development of the film industry, its social and economic impact. Same as THA 310.

COM 311 Qtr. Hrs. - 4 (4,0)
Business and Professional Communication: Investigation of the basic principles of communication as applied to business with emphasis on the written and oral communicative acts.

COM 312 Qtr. Hrs. - 4 (4,0)
Leadership Through Oral Communication: A theoretical and practical investigation of leadership in oral communication situations, principles of parliamentary law, and approaches to problem solving.

COM 313 Qtr. Hrs. - 4 (4,0)
Interpersonal Communication: Nature of the communication process; variables affecting the process and the individuals involved. Analysis of communication models, interactant behavior, situational cues, verbal and nonverbal messages.

COM 320 Qtr. Hrs. - 4 (4,0)
Introduction to Communicative Disorders: Etiology, symptoms, and methods of diagnosing and treating communicative disorders. For beginning and prospective majors in Communicative Disorders.

COM 321 Qtr. Hrs. - 4 (4,0)
Biolinguistics: The Communicative Dyad: Species-inherited communicative bonding: Evolution of mother-infant dyads in mankind and animals. Foundations of biolinguistic and social imprinting with implications for communicative disorders.

COM 350 Qtr. Hrs. - 4 (4,0)
Oral Communication For Television: PR: SPE 101. Practice and performance in speech preparation and delivery for television. Types of speeches include the television demonstrative, television stimulative and the television persuasive. All speeches are televised in the television laboratory.

COM 363 Qtr. Hrs. - 4 (4,0)
Group Interaction and Decision Making: A study of small group processes. Attention is given to problem solving, leadership emergence, conformity behavior, and group member role responsibilities.

COM 377 Qtr. Hrs. - 4 (4,0)
Differential Diagnosis in Communication Disorders: PR: SPE 261, 364; COM 320, 321. Lectures, readings, observations and participation in the evaluative procedures concerned with speech and language skills of the handicapped.

COM 400 Qtr. Hrs. - 4 (4,0)
Opinion and the Mass Media: Role of the mass media in influencing public opinion; techniques of opinion measurement, and impact of opinion polls on voters.

COM 401 Qtr. Hrs. - 4 (4,0)
Communicative Disorders: Articulation: PR: SPE 261, 364; COM 320, PSY 301. Survey of articulation disorders and their management. Observations required.

COM 402 Qtr. Hrs. - 4 (4,0)
Communicative Disorders: Language: PR: SPE 261, 364; COM 320. Survey of language disorders and their management. Observations required.

COM 403 Qtr. Hrs. - 4 (4,0)
Communicative Disorders: Voice: PR: SPE 261, 364, COM 320 and PSY 301. Survey of voice disorders and their management. Observations required.

COM 404 Qtr. Hrs. - 4 (4,0)
Communicative Disorders: Stuttering: PR: SPE 261, 364, COM 320 and PSY 301. Survey of rhythm disorders and their management. Observations required.

COM 405 Qtr. Hrs. - 4 (4,0)
Clinical Methods in Communicative Disorders: PR: SPE 261, 364; COM 320, 321. An analysis of techniques and methods of planning and executing therapeutic programs for communicatively handicapped individuals.

COM 406 Qtr. Hrs. - 5 (5,0)
Basic Instrumentation for Communicative Disorders: PR: C.I. Calibration and instrumentation for communicative sciences. Basics of circuitry as well as operation and minor repairs of audiological and speech pathology.

COM 410 Qtr. Hrs. - 4 (4-0)
Social Responsibilities of the Mass Media: Relationships between the mass media and society; examination of social and ethical responsibilities of the media.

COM 411 Qtr. Hrs. - 4 (4,0)
Legal Responsibilities of the Mass Media: Legal rights and restrictions, including Constitutional guarantees, libel, invasion of privacy, and contempt of court.

COM 414 Qtr. Hrs. - 4 (4,0)
Mass Communication and Government: Role, responsibilities, and non-legal problems of both the government and press in the process of conveying governmental news to the public.

COM 415 Qtr. Hrs. - 4 (4,0)
Informational Communication: An examination of available communication systems (non-technical) and their utilization within business, educational, entertainment, industrial, medical, and military organization.

COM 420 Qtr. Hrs. - 1 (1,1)
Practicum in Communication: PR: C.I. May be repeated three times for credit.

COM 421 Qtr. Hrs. - 2 (2,0)
Current Affairs Analysis: An analytical approach to the handling of the major news events through mass communications, with emphasis on their social, economic, political, cultural and historical impact.

COM 429 Qtr. Hrs. - 4 (4,0)
Mass Media and Popular Culture: An impact study of mass media upon American culture past to present.

COM 440 Qtr. Hrs. - 1-12 (0,1-12)
Clinical Observation and Practice: PR: C.I. Observation and supervised participation in speech pathology and audiology in the university clinic and local clinics.

COM 444 Qtr. Hrs. - 4 (4,0)
Speech Science: PR: C.I. A comprehensive study of the physics of sound as related to the vocal mechanism including the use of instrumentation in voice analysis.

COM 445 Qtr. Hrs. - 4 (4,2)
Basic Audiology: PR: SPE 261, 364; COM 320. Introduction to physics of sound, anatomy of hearing mechanism, pure tone audiometry, hearing aids, problems of the hearing handicapped. Observation and practice required.

COM 450 Qtr. Hrs. - 4 (4,0)
Aural Habilitation: PR: COM 445. Principles and procedures in the utilization of residual hearing, auditory training, speech reading and the use of hearing aids.

COM 451 Qtr. Hrs. - 5 (5,0)
Speech and Language for the Deaf and Hard of Hearing: PR: C.I. Principles of language and speech development in pre-school and school-age hard-of-hearing and deaf children.

COM 457 Qtr. Hrs. - 12-15 (0,12-15)
Communication Internship: PR: C.I. Internship in radio, television, film, journalism, public relations, advertising and speech involving practicum at selected professional communications organizations for one quarter. In addition to a regular prescribed work schedule, the intern must submit a weekly log of his activities and produce a significant research paper.

COM 460 Qtr. Hrs. - 4 (4,0)
Group Dynamics: A study of human behavior in group situations.

COM 463 Qtr. Hrs. - 4 (4,0)
Studies in Listening: Analysis of current trends, professional literature, and resource materials bearing upon the teaching of listening. Practice in listening; preparing listening experiences; oral and written reports.

COM 501 Qtr. Hrs. - 4 (4,0)
Speech Communication Instruction: PR: C.I. Communication models as teaching devices, design of communication curricula, instructional media with speech practicum and classroom criticism and evaluation.

COM 507 Qtr. Hrs. - 4 (4,0)
Freelance Writing: PR: Evidence of satisfactory writing skills. A study of the techniques and procedures of freelance writing, including the preparation of several manuscripts.

COM 510 Qtr. Hrs. - 4 (4,0)
Survey of Communicative Disorders: A survey of speech, language and hearing disorders for habilitative personnel and other interested professionals.

COM 511 Qtr. Hrs. - 5 (5,0)
Communicative Disorders Programs for the Public Schools: PR: C.I. Methods and techniques for the public school clinician; including organization of public school programs. Observations required.

COM 512 Qtr. Hrs. - 4 (4,0)
Audiology: PR: C.I. Advanced techniques in pure-tone, speech, and automatic audiometry, with emphasis on interpretation of audiograms and differential diagnosis. Practice required.

COM 513 Qtr. Hrs. - 4 (4,0)
Auditory Problems of Infants and Children: PR: C.I. Development of sensory perception, auditory deprivation, tests, and testing techniques with the neonate, infant, and young child.

COM 514 Qtr. Hrs. - 4 (4,0)
Hearing Conservation: PR: C.I. Information regarding the prevention of hearing loss and the establishing of hearing conservation programs.

COM 520 Qtr. Hrs. - 4 (4,2)
Psycholinguistics: Foundations of language in affective consciousness and the human nervous system. Pragmatic analysis of word meaning and its precise scientific measurement. Implications for Communicative Disorders.

COM 562 Qtr. Hrs. - 4 (4,0)
Persuasion: Attitude Formation and Change: A survey of the immediate and direct ways in which persuasive communications and social groups come to influence attitudes.

COM 568 Qtr. Hrs. - 5 (4,0)
Evolution of Communication Theory: General Survey: Major communication trends from classical era to the present. Comparison of Aristotelian and non-Aristotelian rhetorics. Contributions of principal figures will be discussed.

COM 572 Qtr. Hrs. - 4 (4,0)
Rhetoric of Social and Political Action: PR: Junior Standing. A critical investigation of social and political speaking within contemporary American society including agitative rhetoric of social and political dissent.

COM 602 Qtr. Hrs. - 4 (4,0)
Modern Communication Theory: Comparative analysis of theories and models of human communication: behavior systems, encoding and decoding processes, interaction variables, and social context.

COM 603 Qtr. Hrs. - 4 (4,0)
Information and Educational Systems: PR: C.I. Sources, processing and transmittal of educational and informational materials (software) used in educational broadcast systems, information retrieval systems, learning machines, etc.

COM 605 Qtr. Hrs. - 1-15 (0,1-15)
Clinical Practice in Language and Speech Pathology: PR: COM 405 and C.I. Advanced clinical practice in diagnosis and treatment of communicative disorders. May be repeated with change of content, not to exceed a total of 15 hours.

COM 612 Qtr. Hrs. - 4 (4,0)
Comparative International Communication Organizations: A study of the principal mass communication organizations of the world.

COM 613 Qtr. Hrs. - 4 (4,0)
Communication and Society: The importance of communications in societal stress situations, with emphasis on current problems.

COM 617 Qtr. Hrs. - 4 (4,0)
Governmental Public Relations: PR: C.I. Emphasis study of campaign planning, image and public affairs activities of political aspirants and executive governmental offices at the city, county, state and federal levels.

COM 620 Qtr. Hrs. - 4 (4,0)
Studies in Persuasion: Survey and evaluation of experimental research in persuasion.

COM 621 Qtr. Hrs. - 4 (4,0)
Persuasion in the Media: Study of persuasive campaign with focus upon ethics, methodology, and strategies toward accomplishing the communication end.

COM 622 Qtr. Hrs. - 4 (4,0)
Small Group Communication: PR: C.I. A study of communication and its effect on small group behavior.

COM 625 Qtr. Hrs. - 4 (4,0)
Problems in Broadcast Journalism: PR: C.I. Analysis of electronic journalistic policies, sources and control of information.

COM 628 Qtr. Hrs. - 4 (4,0)
Audience Measurement: PR: C.I. Examination and review of audience measurement techniques. Individual assignments for compilation and analysis of measurement data.

COM 630 Qtr. Hrs. - 4 (4,0)
Communications Management: PR: C.I. Analysis and developments, with reference to particular media. Organizational theory, structure and behavior. Management principles and operations.

COM 635 Qtr. Hrs. - 4 (4,0)
Legal Aspects of Mass Communication Law: PR: C.I. Further study into the legal rights and restrictions affecting the mass media.

COM 636 Qtr. Hrs. - 4 (4,0)
Management of Communicative Disorders Programs: PR: C.I. Techniques for establishing and conducting a program in communicative disorders, including patient handling, equipment needs, fund raising, and public relations.

COM 640 Qtr. Hrs. - 4 (4,0)
Effects of Advertising on Society: An in-depth study of advertising's effects on consumer behavior, societal mores and media economics.

COM 645 Qtr. Hrs. - 3 (3,0)
Speech of the Laryngectomee: PR: C.I. Basic principles and practice for developing and improving the speech of the laryngectomee.

COM 646 Qtr. Hrs. - 4 (4,0)
Aphasia: PR: C.I. Etiology, diagnostic techniques and management of the adult aphasic patient.

COM 647 Qtr. Hrs. - 4 (4,0)
Auditory Amplification: Physical characteristics and clinical aspects of auditory amplifiers for the hearing handicapped. Clinical observations required.

COM 648 Qtr. Hrs. - 4 (4,0)
Electrophysiological Audiometry: PR: C.I. An investigation into the use of electro-dermal, electro-encephalography, electro-cardiography, electronystagmography, and other such systems employed in the detection of hearing impairment.

COM 649 Qtr. Hrs. - 4 (4,0)
Industrial Audiology: PR: C.I. A study of the problems of noise pollution in the community. Emphasis is placed upon psychological and physiological problems associated with noise. Noise studies performed.

COM 650 Qtr. Hrs. - 4 (4,0)
Otological Relationships to Audiology: PR: C.I. Medical aspects and their relations to auditory assessment of hearing. Etiologies of auditory anomalies are reviewed relative to surgical, medical and rehabilitative correction.

COM 660 Qtr. Hrs. - 4 (4,0)
Advanced Studies in Communicative Disorders: Articulation: Specific diagnostic techniques and therapeutic procedures for articulation disorders.

COM 661 Qtr. Hrs. - 4 (4,0)
Advanced Studies in Communicative Disorders: Language: Specific diagnostic techniques and therapeutic procedures for language disorders.

COM 662 Qtr. Hrs. - 4 (4,0)
Advanced Studies in Communicative Disorders: Cleft Palate and Other Oral Abnormalities: Specific diagnostic techniques and therapeutic procedures for cleft palate and other oral abnormalities.

COM 663 Qtr. Hrs. - 4 (4,0)
Advanced Studies in Communicative Disorders: Neurological Disorders: Specific diagnostic techniques and therapeutic procedures for neurological disorders.

COM 664 Qtr. Hrs. - 4 (4,0)
Advanced Studies in Communicative Disorders: Voice: Specific diagnostic techniques and therapeutic procedures for voice disorders.

COM 665 Qtr. Hrs. - 4 (4,0)
Advanced Studies in Communicative Disorders: Stuttering: Specific diagnostic techniques and therapeutic procedures for stuttering.

COM 666 Qtr. Hrs. - 4 (4,0)
Advanced Studies in Communicative Disorders: Dialect: Specific diagnostic techniques and therapeutic procedures for dialect.

COM 667 Qtr. Hrs. - 4 (4,0)
Advanced Studies in Communicative Disorders: Orthography: The relationship between written and spoken language: disturbances of inner language arising from incompatibility and of the interfacing between written and spoken language.

COM 668 Qtr. Hrs. - 4 (4,0)
Advanced Studies in Communicative Disorders: Auditory Perception: Specific diagnostic techniques and therapeutic procedures for auditory perception problems.

COMPUTER SCIENCE

COMP 101 Qtr. Hrs. - 4 (4,0)
Introduction to Computer Science: History; typical computer; elements and symbology; number systems; arithmetic operations; control and data flow; peripheral components; memory devices; case study of an application of computers.

COMP 102 Qtr. Hrs. - 3 (3,0)
Computer Programming: PR: MATH 110 or the equivalent. Problem definitions, algorithms, flow charts, digital computer programming using a higher level language (FORTRAN).

COMP 205 Qtr. Hrs. - 3 (3,0)
Algorithmic Process I: PR: MATH 110 or equivalent. Use of computers, problem solving, algorithms, computer organization, assignment statements, data types, input/output, program logic, looping, arrays, selected projects.

COMP 206 Qtr. Hrs. - 3 (3,0)
Algorithmic Processes II: PR: COMP 205. Computing systems, procedures, storage allocation, parameter access, recursion, debugging techniques, selected projects.

COMP 301 Qtr. Hrs. - 3 (3,0)
Computing Processes: PR: At least one programming course. An accelerated course in algorithmic and computing concepts for the student with significant knowledge of at least one programming language. Credit may not be earned in both COMP 301 and the COMP 205, 206 sequence.

COMP 302 Qtr. Hrs. - 3 (3,0)
Programming and Numerical Methods: CR: MATH 322. FORTRAN, approximations, numerical applications.

COMP 303 Qtr. Hrs. - 3 (3,0)
Computer Fundamentals for Business Applications I: History of computers; processing information; manual information processing systems; introduction to electronic computer systems; storage of information; solving problems; preparation of common business reports.

COMP 304 Qtr. Hrs. - 3 (3,0)
Computer Fundamentals for Business Applications II: PR: COMP 303 or equivalent. Introduction to business systems, business parameters, information flow, business data processing terminology, program creation, documentation, and operations orientation.

COMP 305 Qtr. Hrs. - 4 (4,0)
Assembly Language Programming Laboratory: PR: COMP 206 or COMP 301 or COMP 302. Computer structure and assembly language.

COMP 306 Qtr. Hrs. - 4 (4,0)
Computers and Programming: PR: COMP 305 and COMP 307. Computer Systems organization, micro-programming, symbolic assembly systems, macros, program segmentation and linkage, systems and utility programs, selected projects using a mini-computer.

COMP 307 Qtr. Hrs. - 3 (3,0)
Algorithmic Processes III: PR: COMP 206 or COMP 301. Strings, lists, trees, graphs, files, job control language, numeric and non-numeric applications, selected projects.

COMP 310 Qtr. Hrs. - 3 (3,0)
Business Data Processing Software Survey: PR: COMP 304. Introduction to functional characteristics of problem-oriented languages. COBOL, PL/1, RPG, FORTRAN, BASIC, APL. Overview of functional operating systems.

COMP 311 Qtr. Hrs. - 3 (3,0)
Analysis of Computer Systems and Hardware Capabilities: PR: COMP 304. Characteristics of computers and related equipment from business usage standpoint. Techniques of measuring hardware and system performance, benchmarking, task mix parameters, simulation and configuration analysis.

COMP 331 Qtr. Hrs. - 4 (4,0)
Discrete Structures in Computer Science: PR: COMP 307, MATH 271 and a course in statistics. Recursion; algorithms for listing permutations, combinations, samples, and selections; Markov algorithms; theory of directed and undirected graphs; applications to computer science.

COMP 340 Qtr. Hrs. - 3 (3,0)
Data Structures and Operating Systems for Business: PR: COMP 304. Examinations of data set structures and relations to file activity. Operating system services, multiprogramming, accounting, background-foreground processing, overhead cost analysis.

COMP 361 Qtr. Hrs. - 4 (4,0)
Numerical Calculus: PR: COMP 206 and MATH 324. Numerical solution of algebraic and transcendental equations, systems of equations, ordinary differential equations, FORTRAN.

COMP 387 Qtr. Hrs. 3 (3,0)
Computer Programming with Business Applications: PR: Any COMP Course. COBOL programming, RPG, data processing applications.

COMP 401 Qtr. Hrs. - 4 (4,0)
Computer Organization I: PR: COMP 306, EECS 311. Processor characteristics, peripheral equipment characteristics, information representation, introduction to data communications.

COMP 405 Qtr. Hrs. 4 (4,0)
Data Structures: PR: COMP 305 and COMP 307. Basic concepts of data; linear lists, strings, arrays, and orthogonal lists; ordering or sorting techniques; recursion; string and list processing languages.0)

COMP 408 Qtr. Hrs. 4 (4,0)
Programming Languages I: PR: COMP 307. Formal definitions of programming languages, global properties of algorithmic languages.

COMP 411 Qtr. Hrs. - 4 (4,0)
Systems Programming I: PR: COMP 306 and COMP 405. Task scheduling, file management, file security, multi-programming, communication between system components, system logs and accounting and status reporting.

COMP 481 Qtr. Hrs. - 4 (4,0)
Computer Processing of Statistical Data: PR: STAT 402 and knowledge of FORTRAN, or C.I. Use of computers in statistical analysis; error analysis; Monte Carlo calculations; simulation; matrix calculations; regression; nonlinear estimation; principal components; factor analysis; analysis of variance/covariance.

COMP 484 Qtr. Hrs. - 3 (3,0)
Health Information Systems: PR: COMP 303. Survey of the current health information systems, application of automated data processing techniques to the health field, manual systems needed to support them.

COMP 487 Qtr. Hrs. - 3 (3,0)
Computer Processing of Business Data I: PR: Junior standing and COMP 303. Computers in business data processing; applications in accounting, payroll, inventory control, and production control; file organization, development, and control; on-line systems and controls.

COMP 488 Qtr. Hrs. - 3 (3,0)
Computer Processing of Business Data II: PR: COMP 487. Continuation of COMP 487.

COMP 489 Qtr. Hrs. - 3 (3,0)
Computer Processing of Business Data III: PR: COMP 488. Continuation of COMP 488.

COMP 501 Qtr. Hrs. - 3 (3,0)
Digital Computing: PR: MATH 323. Digital computer programming; internal operation of the computer; current developments in programming languages and computers. Intended for secondary school mathematics teachers.

COMP 503 Qtr. Hrs. - 4 (4,0)
Hardware Concepts: CR: COMP 511 or equivalent. Storage organization and searching, logic, data-flow, computer architecture.

COMP 505 Qtr. Hrs. - 4 (4,0)
Algorithmic Concepts: PR: Acceptance into a graduate program. Computer organization, flow-charts, computing systems, errors, data structures, selected projects using PL/I.

COMP 508 Qtr. Hrs. - 4 (4,0)
Programming Languages II: PR COMP 405. List Processing, string manipulation, data description, and simulation languages.

COMP 511 Qtr. Hrs. - 4 (4,0)
Software Concepts: PR: COMP 505 or equivalent. Machine and assembly language, micro-programming, systems and utility programs, data structures.

COMP 521 Qtr. Hrs. - 3 (3,0)
Compiler Structure I: PR: COMP 405 and COMP 408. Syntax analysis; bootstrapping and metacompilers; languages for compiler writing, storage allocation, mapping, dynamic allocation; scanners; symbol tables; code emitters; one-pass and multi-pass systems; code optimization.

COMP 522 Qtr. Hrs. - 3 (3,0)
Compiler Structure II: PR: COMP 521. Continuation of COMP 521.

COMP 561 Qtr. Hrs. - 4 (4,0)
Numerical Analysis I: PR: COMP 361 and MATH 317. Fixed-point interation, matrix computations, interpolation, error analysis, differentiation and intergration, solution of systems of ordinary differential equations.

COMP 565 Qtr. Hrs. - 4 (4,0)
Scientific Applications Concepts: PR: COMP 505 or the equivalent; and MATH 324. Use of computers in science and engineering, techniques and applications.

COMP 585 Qtr. Hrs. 4 (4,0)
Commercial Applications Concepts: PR: Acceptance in a graduate program. Automated business systems and their definition.

COMP 601 Qtr. Hrs. 4 (4,0)
Computer Organization II: PR: COMP 503 or the equivalent. Computer system design problems, memory utilization, storage management, addressing, control and input-output, specific examples of computer architecture, array computers, variable structure computers.

COMP 602 Qtr. Hrs. - 4 (4,0)
Computer Organization III: PR: COMP 601. Continuation of COMP 601.

COMP 605 Qtr. Hrs. - 3 (3,0)
Economics of Computers: PR: COMP 585 and a course in microeconomics; or C.I. The computer industry, terms and conditions of sale and rental, cost and effectiveness of computer systems, pricing computer services.

COMP 607 Qtr. Hrs. - 3 (3,0)
Philosophy of Programming: PR: 8 hours of programming. Program organization, structured programming and allied topics, case studies and projects.

COMP 611 Qtr. Hrs. - 4 (4,0)
Systems Programming II: PR: COMP 503 and 511; or equivalent. Batch process systems, parallel processing, multiprogramming and multiprocessing, user services and facilities.

COMP 612 Qtr. Hrs. - 4 (4,0)
Systems Programming III: PR: COMP 611. Continuation of COMP 611.

COMP 615 Qtr. Hrs. - 3 (3,0)
Simulation of Computer Systems: PR: COMP 511 or equivalent; and ~~STAT 525~~. Application of system methodology to hardware and software systems. → IEMS 620

COMP 617 Qtr. Hrs. - 4 (4,0)
Information Organization and Retrieval: PR: COMP 511 or the equivalent. Models for structured information, analysis of information content, automatic retrieval systems, evaluation of retrieval effectiveness.

COMP 618 Qtr. Hrs. - 3 (3,0)
Computer Graphics Systems: PR: COMP 511. Systems software and data structures for graphics devices and display processors.

COMP 651 Qtr. Hrs. - 3 (3,0)
File Systems: PR: COMP 601 and COMP 611. Functions of file systems, file system organization and structure, analysis of file systems, data management systems.

COMP 653 Qtr. Hrs. - 3 (3,0)
Computer-Based Communications Networks: PR: COMP 585 or the equivalent. Functions of communications systems, communication system hardware, communication system organization and structure, examples.

COMP 655 Qtr. Hrs. - 3 (3,0)
Information Analysis: PR: COMP 585 or the equivalent. Determination of information requirements and alternatives, basic tools.

COMP 656 Qtr. Hrs. - 3 (3,0)
Information System Design: PR: COMP 655. Tools and objectives, hardware/software selection and evaluation, data base development, program development, system implementation, post implementation and analysis. This course emphasizes the distributed processing approach.

COMP 661 Qtr. Hrs. - 4 (4,0)
Numerical Analysis II: PR: COMP 561. Mathematical stability and ill conditioning, discretization error, convergence of iterative methods, rounding error.

COMP 681 Qtr. Hrs. - 3 (3,0)
Managing the Computer Professional: PR: COMP 585 and MGMT 501; or C.I. The programming group, team and project tasks, personality factors, motivating, training, experience.

COOPERATIVE EDUCATION

COED 100 Qtr. Hrs. - 0*
Cooperative Education, Freshman Year

COED 200 Qtr. Hrs. - 0*
Cooperative Education, Sophomore Year

COED 300 Qtr. Hrs. - 0*
Cooperative Education, Junior Year

COED 400 Qtr. Hrs. - 0*
Cooperative Education, Senior Year
*May be repeated

CRIMINAL JUSTICE

CRJ 201 Qtr. Hrs. - 4 (4,0)
Law Enforcement: Survey of the history and philosophy of law enforcement. The role of the police in the system of criminal justice will be emphasized.

CRJ 205 Qtr. Hrs. - 4 (4,0)
Police Science and Technology: PR: CRJ 201. Study of operational concepts of investigative and scientific professions as affecting discovery, preservation, and examination of physical tracings from negligent or criminal events.

CRJ 207 Qtr. Hrs. - 4 (4,0)
Criminal Investigation: A comprehensive survey of the modern methods and procedures used in the investigation and solution of criminal offenses.

CRJ 300 Qtr. Hrs. - 4 (4,0)
Crime in America: A survey of crime and criminality in the United States with emphasis on crime data and its weaknesses, theories of causation, and types of criminal behavior.

CRJ 301 Qtr. Hrs. - 4 (4,0)
Criminal Law in Action: Basic concepts of criminal law, their origin and development; constitutional and procedural rules; and Federal and State relations in the administration of justice.

CRJ 302 Qtr. Hrs. - 4 (4,0)
Administration of Justice: The broad system of criminal justice in America, and examination of various goals and conflicts present within law enforcement, court and corrections sub-systems.

CRJ 303 Qtr. Hrs. - 4 (4,0)
Municipal Police Administration: PR: CRJ 201. Advanced study of contemporary operational concepts of administration with an emphasis on function, rather than structure.

CRJ 304 Qtr. Hrs. - 4 (4,0)
The Police Managers: PR: C.I. Elements of first-line supervision and executive development. Administrative leadership; its situational nature; methods and traits; recent theories and research on leadership.

CRJ 310 Qtr. Hrs. - 4 (4,0)
The Correctional and Penal Systems: Theories, structures and methods of institutions and noninstitutional services in the correctional rehabilitation of criminal and juvenile offenders.

CRJ 311 Qtr. Hrs. - 4 (4,0)
Probation and Parole: Analysis of probation and parole services and systems: the organization, administration and management of treatment and field services for various types of public offenders.

CRJ 400 Qtr. Hrs. - 4 (4,0)
Police and the Community: Police relationships with citizenry. Ethnic and social conflict in relation to law enforcement, and how police deal with groups, crowds, gangs and nonconformist cultures.

CRJ 407 Qtr. Hrs. - 4 (4,0)
Comparative Justice Systems: A survey of contemporary foreign law enforcement systems, operational and philosophical differences emerging from various cultural and legal systems.

CRJ 410 Qtr. Hrs. - 4 (4,0)
Financial Adminsitration and Budgeting: PR: C.I. Police budgets as instruments of policy making and management. Financial, fiscal, administrative and legal aspects of budgeting.

CRJ 411 Qtr. Hrs. - 4 (4,0)
Justice Policy and Social Conflict: The effects of social conflicts and political decisions upon the administration of justice, especially the role assigned law enforcement in dealing with social problems.

CRJ 422 Qtr. Hrs. - 4 (4,0)
Delinquency Control: Examination of programs and institutions including juvenile court process, intake services, juvenile bureau administration, youth authority programs and drug abuse control.

CRJ 423 Qtr. Hrs. - 4 (4,0)
Corrections Administration:Organization administration and operation of short and long term detention facilities or institutions including classification, treatment, security, supervision and prison sub-culture problems.

ECON 301 4(4,0) F,W,S,Su
INTERMEDIATE PRICE THEORY: PR: ECON 202 and ECON 203. Theoretical analysis of the determination of product and factor prices under different market structures.

ECONOMICS

ECON 201 Qtr. Hrs. - 3 (3,0)
Fundamentals of Economics: An introductory course designed to provide the nonbusiness student with a terminal course in the fundamentals of economics. Not open to business majors.

ECON 202 Qtr. Hrs. - 4 (4,0)
Principles of Microeconomics: The determination of prices in a market economy; their role in allocating consumer and producer goods and in distributing incomes. Efficiency of markets and evaluation of public policies designed to improve efficiency.

ECON 203 Qtr. Hrs. - 4 (4,0)
Principles of Macroeconomics: PR: ECON 202. A study of national income accounting, income and employment theory, business fluctuations, money and banking, and monetary and fiscal policy in the U.S. economy.

ECON 301

ECON 307 Qtr. Hrs. - 4 (4,0)
American Economic History: An introduction to the economic development of the United States with emphasis upon agriculture, labor, industrialization, transportation, and banking. (Same as HIST 311).

ECON 311 Qtr. Hrs. - 4 (4,0)
Intermediate Money, Income and Employment Theory: PR: ECON 202 and ECON 203. Theoretical analysis of the determination of national income and employment, including an examination of the monetary system.

ECON 321 Qtr. Hrs. - 4 (4,0)
Quantitative Methods and Business Decision Analysis: PR: STAT 301. The use of statistical methods as scientific tools in the analysis of economic and business problems to aid in the process of decision making.

ECON 328 Qtr. Hrs. - 4 (4,0)
Transportation Economics: PR: ECON 202 or 203. Study of general economic characteristics and governmental regulation of public carriers. Consideration of competitive relations between modes of transportation. Criteria for public investment in highway, airport, and other transportation facilities.

ECON 331 Qtr. Hrs. - 3 (3,0)
Economics of Labor: PR: ECON 202 and ECON 203. A survey of the growth, structure, objectives, and collective bargaining practices of organized labor groups.

ECON 332 Qtr. Hrs. - 3 (3,0)
Manpower and Human Resources: PR: ECON 202 and ECON 203. Examines labor as a human resource or human capital. Special emphasis placed upon the changing role of manpower and manpower policies.

ECON 341 Qtr. Hrs. - 3 (3,0)
International Economics: PR: ECON 202 and ECON 203. Fundamental principles of international trade and foreign exchange, including the balance of payments and problems of foreign economic policy.

ECON 381 Qtr. Hrs. - 3 (3,0)
Economics of Public Utilities: PR: ACCY 211 and ACCY 212 or ACCY 307, and ECON 202, ECON 203 or C.I. The nature of public utilities, the economics of rate determination, and regulatory policy.

ECON 401 Qtr. Hrs. - 3 (3,0)
Managerial Economics: PR: ECON 202 and ECON 203. The uses of economic analysis in economic decision-making and business policy formulation.

ECON 411 Qtr. Hrs. - 3 (3,0)
Comparative Economic Systems: PR: ECON 202 and ECON 203. An analysis of the fundamental institutions of the American economic system and a comparison of the American economic system with other economic systems.

ECON 421 Otr. Hrs. - 3 (3,0)
Economic Statistical Analysis: PR: ECON 321. Concepts and methods of developing, analyzing, and interpreting measures of economic activity, and business and economic change.

ECON 431 Qtr. Hrs. - 3 (3,0)
Public Finance in the American Economy: PR: ECON 202 and ECON 203. Analysis of fiscal institutions and decision-making in the public sector of the American economy; budget planning and execution, taxation, debt, and theory of taxes.

ECON 435 Qtr. Hrs. - 3 (3,0)
Monetary Theory and Policy: PR: FIN 331. A study of the factors that influence the supply of and demand for money and credit, and the effect of changes in these factors on the allocation of resources, levels of national income, employment, and prices.

ECON 441 Qtr. Hrs. - 3 (3,0)
Economic Development: PR: ECON 202 and ECON 203. The processes and problems of economic development.

ECON 461 Qtr. Hrs. - 3 (3,0)
Business and Government: PR: ECON 202 and ECON 203. A survey of the most significant public policies affecting business firms.

ECON 471 Qtr. Hrs. - 3 (3,0)
History of Economic Thought: PR: ECON 202 and ECON 203. A study of the leading ideas of the major contributors to the development of economic thought.

ECON 501 Qtr. Hrs. - 4 (4,0)
Economic Concepts: PR: Acceptance into the M.B.A. Program. Introduction to economic analysis, including the theory of the market; supply, demand and price determination; income distribution; aggregate income and employment determination.

ECON 521 Qtr. Hrs. - 4 (4,0)
Statistics for Business and Economics: PR: Acceptance into the M.B.A. Program. Statistical theory and problems relating to business and economics including time series and correlation theory, index number theory and statistical inference.

ECON 523 Qtr. Hrs. - 3 (3,0)
Econometric Methods: PR: Graduate standing and Econ 321 or equivalent. The application of econometric methods to economic theory and problems. Emphasis is placed on the validation of a model.

ECON 525 Qtr. Hrs. - 3 (3,0)
Mathematical Economics: PR: ECON 203 and MATH 223. An introduction to the mathematical tools of modern economic analysis.

ECON 551 Qtr. Hrs. - 3 (3,0)
Economics of Urban Areas: PR: ECON 202 and ECON 203. An analysis of the economic problems arising from and associated with the growth of cities and suburban areas within metropolitan districts.

ECON 601 Qtr. Hrs. - 3 (3,0)
Economic Analysis of the Firm: PR: Graduate Standing and ECON 501 or equivalent. Commodity price and output determination; factor price determination and functional income distribution; analysis of different types of markets.

ECON 602 Qtr. Hrs. - 5 (5,0)
Price Theory: PR: Graduate standing and ECON 301 or equivalent. An analysis of the theory of consumer choice, the theory of the firm, and the theory of distribution.

ECON 611 Qtr. Hrs. - 3 (3,0)
Aggregate Economics-Income, Unemployment and Growth: PR: Graduate standing and ECON 501 or equivalent. Macroeconomic measurement, theory and policy, designed specifically for the student who possesses a limited grasp of economic analysis.

ECON 612 Qtr. Hrs. - 5 (5,0)
Macroeconomic Theory: PR: Graduate standing and ECON 311 or equivalent. An analysis of the nature and determinants of aggregate output, employment, income, and spending, with specific emphasis on the achievement of economic stability.

ECON 621 Qtr. Hrs. - 3 (3,0)
Statistical Models for Business: PR: Graduate Standing and ECON 521 or equivalent. The theory of model analysis including the validation of model assumptions through Monte Carlo analysis and advanced statistical techniques.

ECON 622 Qtr. Hrs. - 5 (5,0)
Statistical Analysis of Economic Data: PR: Graduate standing and ECON 321 or equivalent. A study of the concepts and methods of developing, analyzing, and interpreting measures of economic activity.

ECON 631 Qtr. Hrs. - 3 (3,0)
Public Finance and Financial Policy: PR: Graduate Standing and ECON 501 or equivalent. Analysis of the fiscal role and instruments of government and their effects on the economy; taxation, debt, and fiscal policy.

ECON 635 Qtr. Hrs. - 3 (3,0)
Money, Banking and Economic Activity: PR: Graduate Standing. A study of the institutions in which the money supply is generated and the influence of monetary policy on economic stability and growth.

ECON 636 Qtr. Hrs. - 3 (3,0)
Monetary Theory and Policy: PR: Graduate standing and a course in Money and Banking. An analysis of the fundamental theory underlying the supply of money, demand for money and effects of monetary variables on the level of economic activity.

ECON 641 Qtr. Hrs. - 3 (3,0)
Theory of International Finance and Monetary Institutions: PR: Graduate standing. Analysis of the international money market, international equilibrium and adjustment mechanism, exchange rate variations, balance of payments, capital flows, and effects of international monetary policies.

ECON 642 Qtr. Hrs. - 3 (3,0)
International Trade: PR: Graduate standing. An inquiry into the theory of international trade, commercial policy and economic integration.

ECON 645 Qtr. Hrs. - 3 (3,0)
Economic Development: PR: Graduate standing. Analysis of theories and problems of growth and development with special attention to resource scarcity, population growth, and interaction of foreign trade and internal development.

ECON 647 Qtr. Hrs. - 5 (5,0)
The Economics of Central Planning: PR: Graduate standing. An analysis of the economics of planning as applied to the economy of the Soviet Union and Soviet type centrally planned economic systems.

ECON 655 Qtr. Hrs. - 3 (3,0)
Environmental Economic Analysis: PR: Graduate standing. An investigation of environmental problems, methods of economic analysis, policies of environmental protection, and difficulties in making quantitative assessments of environmental damages.

ECON 661 Qtr. Hrs. - 3 (3,0)
Labor Economics: PR: Graduate Standing and ECON 501 or equivalent. An investigation into the nature and function of the labor markets, with specific concern for both institutional and non-institutional imbalance.

ECON 671 Qtr. Hrs. - 3 (3,0)
History of Economic Thought: PR: Graduate standing. The history and development of Pre-Keynesian economic doctrines with emphasis on classical and post-classical economic thought.

ECON 681 Qtr. Hrs. - 3 (3,0)
The Economics of Regulated Industries: PR: Graduate standing. Economic, legal, and administrative concepts of regulation with emphasis on goals, tasks, phases, and procedures of regulation pertaining to transportation, electric, gas, and communications systems.

ECON 683 Qtr. Hrs. - 3 (3,0)
Industrial Organization and Performance: PR: Graduate standing. A study of the performance of industries representative of various types of market structures and practices, relative to price and efficiency.

EDUCATION, ADMINISTRATION AND SUPERVISION

EDAD 601 Qtr. Hrs. - 5 (5,0)
Organization and Administration of Schools: PR: Rank III Certificate or C.I. School organizational patterns kindergarten through junior college. Study of functions such as scheduling, staffing, community relations, design and operation of facilities, financial management.

EDAD 602 Qtr. Hrs. - 5 (5,0)
Organization and Administration of Instructional Programs: PR: Rank III Certificate or C.I. Purpose and functions of school learning centers, curricula, media, and establishment of educational priorities; review and analysis of various grouping patterns for individualizing instruction.

EDAD 603 Qtr. Hrs. - 4 (4,0)
Legal Aspects of School Operation: PR: Rank III Certificate or C.I. Study of state and federal laws affecting the operation of public schools emphasizing individual rights and responsibilities of students, faculty, and administrators.

EDAD 611 Qtr. Hrs. - 4 (4,0)
Educational Supervisory Functions: PR: Rank III Certificate or C.I. Analysis of school supervisory functions in human relations, leadership, personnel administration, and in-service education for instructional improvement.

EDAD 612 Qtr. Hrs. - 5 (5,0)
Educational Supervisory Techniques: PR: Rank III Certificate and EDAD 611. Development of techniques in observation, group processes, communication, and evaluation for assessment of school personnel and programs.

BUSINESS EDUCATION — DEVELOPMENTAL

EDBE 101 Qtr. Hrs. - 3 (3,1)
Introductory Typewriting: For the student with no previous instruction in typewriting. Development of basic elements in using the typewriter as a tool of literacy and communications.

EDBE 102 Qtr. Hrs. - 3 (3,1)
Typewriting Production I: PR: EDBE 101 or equivalent. Continuation of development of skills in speed and accuracy and introduction to skill building procedures in communications production.

EDBE 103 Qtr. Hrs. - 3 (3,1)
Typewriting Production II: PR: EDBE 102 or equivalent. Expansion of communications production development, speed and accuracy.

EDBE 201 Qtr. Hrs. - 3 (3,1)
Principles of Shorthand I: PR: Concurrent enrollment in EDBE 101 or equivalent. For students with no previous instruction in shorthand. Introduction to basic theory of Gregg Shorthand, vocabulary development, and speed building.

EDBE 202 Qtr. Hrs. - 3 (3,1)
Principles of Shorthand II: PR: EDBE 102 and EDBE 201 or equivalents. A continuation in the study of shorthand theory, vocabulary development, and speed building.

EDBE 203 Qtr. Hrs. - 3 (3,1)
Principles of Shorthand III: PR: EDBE 102 and EDBE 202 or equivalents. Development and refinement of sustained shorthand dictation, speed, and vocabulary.

EDBE 301 Qtr. Hrs. - 3 (3,1)
Shorthand Dictation: PR: EDBE 102 and EDBE 203 or equivalents. Continued development of shorthand dictation and introductory communications production.

EDBE 302 Qtr. Hrs. - 3 (3,1)
Shorthand Transcription: PR: EDBE 102 and EDBE 301. Gregg Shorthand dictation and refinement of communications production.

EDBE 305 Qtr. Hrs. - 3 (3,1)
Office Technology: PR: EDBE 102 or C.I. Basic operation and function of technological media in modern business offices.

EDBE 406 Qtr. Hrs. - 3 (3,0)
Office Systems and Procedures: PR: EDBE 302. Study of the responsibilities of the executive secretary and office supervisor; records management, travel services, case studies in human relations in executive level job performance.

EDBE 601 Qtr. Hrs. - 3 (3,0)
Curriculum Innovations in Business Education: PR: Rank III Certificate or C.I. A critical analysis of the business curricula in post secondary schools; development of philosophy, objectives, and design of innovative programs in business.

EDBE 602 Qtr. Hrs. 3 (3,0)
Problems, Issues, and Trends in Business Education: PR: Rank III Certificate or C.I. Historical development; fundamentals of business education; its relation to business, vocational and general education, guidance, objectives and contemporary problems.

EDBE 603 Qtr. Hrs. - 3 (3,0)
Analysis, Trends and Research in Typewriting Instruction: PR: Rank III Certificate or C.I. Techniques, materials, and instructional media; psychological principles, evaluation, and special attention to a study of research and new trends of instruction.

EDBE 604 Qtr. Hrs. - 3 (3,0)
Evaluation in Business Education: Rank III Certificate or C.I. A study of standardized and prognostic business education tests; functions, construction, administration, and evaluation of measurement instruments.

EDBE 610 Qtr. Hrs. - 3 (3,0)
Administration and Supervision of Business Education: PR: Rank III Certificate or C.I. Organization, administration, and supervision of Business Education.

EDBE 611 Qtr. Hrs. - 3 (3,0)
Analysis of Instruction in Shorthand and Transcription: PR: Rank III Certificate or C.I. Techniques, materials, and instructional media; psychological principles, evaluation, and special attention to a study of research and new trends of instruction.

EDBE 612 Qtr. Hrs. - 3 (3,0)
Analysis of Instruction in Office Technology: PR: Rank III Certificate or C.I. Techniques, materials and instructional media; psychological principles, evaluation, and special attention to a study of research and new trends of instruction.

EDBE 613 Qtr. Hrs. - 3 (3,0)
Analysis of Instruction in Basic Business and Accounting: PR: Rank III Certificate or C.I. Techniques, materials, and instructional media; psychological principles, evaluation, and special attention to a study of research and new trends of instruction.

EDBE 614 Qtr. Hrs. - 3 (3,0)
Coordination of Cooperative Office Business Education: PR: Rank III Certificate or C.I. A study of cooperative programs; organization and coordination of cooperative business education programs.

EDBE 615 Qtr. Hrs. - 3 (3,0)
Improvement of Related Instruction in Cooperative Business Education: PR: Rank III Certificate or C.I. Techniques, materials, and instructional media; psychological principles, evaluation, and special attention to the study of research and new trends of instruction in related cooperative education study.

ELEMENTARY EDUCATION — DEVELOPMENTAL

EDEL 301 Qtr. Hrs. - 3 (2,1)
Teaching Mathematics in the Elementary School: PR: Admission to Phase II or C.I. Consideration of selected concepts; organizing for instruction, techniques and activities; class and individual diagnosis; remedial procedures.

EDEL 302 Qtr. Hrs. - 3 (2,1)
Mathematics Programs in the Elementary School: PR: EDEL 301. Analysis of teaching arithmetic, geometry and measurement; philosophy and objectives; instructional materials; current research and new curricula.

EDEL 306 Qtr. Hrs. - 3 (2,1)
Music in the Elementary School: Fundamental procedures for teaching elementary school music, stressing appropriate music materials and activities for different age groups; selected experiences in music.

EDEL 307 Qtr. Hrs. - 4 (4,0)
Literature for Children: PR: Admission to Phase II or C.I. General survey of books and materials; criteria for analysis and evaluation; types of books available considered in terms of interests, needs, and abilities of children.

EDEL 311 Qtr. Hrs. - 3 (3,0)
Basic Foundations of Reading: PR: Admission to Phase II or C.I. Introduction to reading; principles, procedures and organization, current practices; analysis of reading materials; correlation with child development; investigation of research.

EDEL 312 Qtr. Hrs. - 3 (3,0)
Reading in the Elementary School: PR: EDEL 311. Study of specific techniques and materials used to develop reading comprehension vocabulary and rate; organizing and directing a reading lesson; individual differences; evaluation procedures.

EDEL 315 Qtr. Hrs. - 3 (3,0)
Teaching Science in the Elementary School: PR: Admission to Phase II or C.I. Consideration of selected themes, problems, and concepts; organizing for instruction; techniques and activities; evaluation procedures.

EDEL 316 Qtr. Hrs. - 3 (3,0)
Elementary School Curriculum: PR: Admission to Phase III or C.I. Basic scope and sequence of the elementary school curriculum; philosophical concepts; techniques and materials for instruction; patterns of organization; planning for instruction.

EDEL 317 Qtr. Hrs. - 3 (3,0)
Teaching Social Science in the Elementary School: PR: Admission to Phase II or C.I. Consideration of selected themes, problems, and concepts; organizing for instruction; techniques and activities; evaluation procedures.

EDEL 318 Qtr. Hrs. - 3 (3,0)
Teaching Physical Education in the Elementary School: PR: EDTA 206 and EDTA 307. Organization, practice, and conduct of elementary school physical education with emphasis on teaching methods.

EDEL 401 Qtr. Hrs. - 3 (3,0)
Programs in Early Childhood Education: PR: Admission to Phase II or C.I. Overview of the philosophy, content, facilities, instructional materials, and activities appropriate for children ages 3, 4, and 5; current research and new curricula. Concurrent laboratory experiences.

EDEL 402 Qtr. Hrs. - 3 (3,0)
Language Arts in Early Childhood Education: PR: Admission to Phase II or C.I. Analysis of content of values and developmental role of language arts programs; application of instructional techniques; curriculum problems relating to reading readiness, perception and cognition.

EDEL 404 Qtr. Hrs. - 3 (3,0)
Organization of Instruction in Nursery-Kindergarten Education: PR: EDEL 401 or EDEL 402. Organization of instruction and methods in areas relating to social science, science, mathematics, health, creative arts, and physical education; development of creative manipulative devices. Concurrent laboratory experiences.

EDEL 405 Qtr. Hrs. - 4 (4,0)
Language Arts in the Elementary School: PR: Admission to Phase II or C.I. Content, principles, materials and techniques involved in teaching speaking, listening, writing, and spelling in the elementary school; organizing for instruction.

EDEL 406 Qtr. Hrs. - 3 (2,1)
Art in the Elementary School: Basic principles, purposes, scope and sequence; organization for instruction; evaluation of activities; selected art experiences.

EDEL 407 Qtr. Hrs. - 3 (3,0)
Classroom Diagnosis and Treatment of Reading Difficulties: PR: EDEL 311 or EDEL 312 or equivalent. Principles and techniques of diagnosis and remedial teaching with the disabled reader; factors related to reading problems — physiological, psychological, cultural; materials for instruction.

EDEL 408 Qtr. Hrs. - 3 (2,1)
Science Programs in the Elementary School: PR: Admission to Phase II or C.I. Overview of the instructional program in natural sciences; philosophy and objectives; special problems; instructional materials; current research and new curricula.

EDEL 409 Qtr. Hrs. - 3 (3,0)
Social Science Programs in the Elementary School: PR: Admission to Phase II or C.I. Overview of the instructional program in the social sciences; philosophy and objectives; special problems; instructional materials; current research and new curricula.

EDEL 415 Qtr. Hrs. - 3 (2,1)
Teaching Elementary School Health and Physical Education: PR: Admission to Phase II or C.I. Observation, organization, practice, and conduct of health and physical education activities in the elementary school.

EDEL 456 Qtr. Hrs. - 2-5
Directed Study in Elementary Education: Workshop for the improvement of the elementary school curriculum. Open to in-service teachers.

EDEL 457 Qtr. Hrs. - 2-5
Directed Study in Elementary Education: PR: EDEL 456. Continuation of EDEL 456.

EDEL 482 Qtr. Hrs. - 3 (3,0)
Drug Abuse Education: PR: C.I. Study of developments relating to drug abuse in contemporary society. Objectives, content, resources, and techniques of drug abuse education.

EDEL 530 Qtr. Hrs. - 4 (4,0)
Developmental Reading: PR: Rank III Certificate or C.I. Principles, procedures, organization, and current practices in the elementary reading program.

EDEL 535 Qtr. Hrs. - 3 (3,0)
Classroom Diagnosis and Treatment of Reading Difficulties: PR: EDEL 530 or equivalent. Principles and techniques of classroom diagnosis and corrective teaching in reading. Consideration of instructional materials.

EDEL 601 Qtr. Hrs. - 5 (5,0)
Elementary School Instructional Programs: PR: Rank III Certificate or C.I. Analysis of the forces which shape and contribute to the vertical and horizontal curriculum designs of elementary schools.

EDEL 604 Qtr. Hrs. - 3 (3,0)
Leadership in Elementary Education: PR: Rank III Certificate or C.I. Current issues with emphasis on the improvement of instruction, analysis of curriculum, and staff development procedures.

EDEL 605 Qtr. Hrs. - 3 (3,0)
Problems in Classroom Teaching in the Elementary School: PR: Rank III Certificate or C.I. Identification and analysis of relevant major instructional problems in the elementary school.

EDEL 606 Qtr. Hrs. - 3 (3,0)
Curriculum Design in Elementary Education: PR: Rank III Certificate or C.I. Design and construction of programs to meet needs of varying levels of student populations. (May be repeated.)

EDEL 610 Qtr. Hrs. - 3 (3,0)
Trends in Elementary School Science Education: PR: Rank III Certificate or C.I. Analysis of historical development and current trends in science education research.

EDEL 620 Qtr. Hrs. - 3 (3,0)
Trends in Elementary School Mathematics Education: PR: Rank III Certificate or C.I. Analysis of historical development and current trends in mathematics education research.

EDEL 621 Qtr. Hrs. - 3 (3,0)
Diagnosis of Difficulties in Elementary School Mathematics: PR: EDEL 620. Study and uses of tests regarding the symptoms and causes of specific learning skills in mathematics.

EDEL 622 Qtr. Hrs. - 3 (3,0)
Remediation of Difficulties in Elementary School Mathematics: PR: EDEL 621. Selection of materials and techniques for a remedial program based on individual diagnosis.

EDEL 630 Qtr. Hrs. - 3 (3,0)
Trends in Elementary School Reading Education: PR: Rank III Certificate or C.I. Analysis of historical development and current trends in reading research.

EDEL 632 Qtr. Hrs. - 3 (3,0)
Corrective Reading for Classroom Teachers I: PR: EDEL 535 or equivalent. A practicum for classroom teachers with emphasis on group diagnostic reading tests and classroom corrective techniques.

EDEL 633 Qtr. Hrs. - 3 (3,0)
Corrective Reading for Classroom Teachers II: PR: EDEL 632 or equivalent. A continuation of EDEL 632.

EDEL 635 Qtr. Hrs. - 3 (3,0)
Diagnosis of Difficulties in Reading: PR: EDEL 535 or equivalent. Administration and interpretation of individual tests. Consideration of physical, psychological and environmental factors contributing to reading difficulties.

EDEL 636 Qtr. Hrs. - 4 (4,0)
Diagnostic Reading Practicum: PR: EDEL 635 or equivalent. Evaluation of reading abilities and difficulties of children in the reading laboratory of the University. Preparation of individual case reports.

EDEL 637 Qtr. Hrs. - 4 (4,0)
Remedial Reading Practicum: PR or CR: EDEL 636. Supervised remedial instruction with individual children. Selection of instructional materials and techniques; preparation of case progress reports; parent interviews.

EDEL 640 Qtr. Hrs. - 3 (3,0)
Trends in Elementary School Language Arts Education: PR: Rank III Certificate or C.I. Analysis of historical development and current trends in language arts research.

EDEL 641 Qtr. Hrs. - 3 (3,0)
Investigation in Children's Literature: PR: Rank III Certificate or C.I. Analysis of the various approaches available for learning through the utilization of children's literature.

EDEL 650 Qtr. Hrs. - 3 (3,0)
Trends in Elementary School Social Science Education: PR: Rank III Certificate or C.I. Analysis of historical development and current trends in social science education research.

EDEL 681 Qtr. Hrs. - 3 (3,0)
Seminar in Early Childhood Education: PR: Rank III Certificate or C.I. Study and evaluation of research applicable to the design and construction of a curriculum for 3, 4 and 5 year old children.

EXCEPTIONAL CHILD EDUCATION

EDEX 511 Qtr. Hrs. - 4 (4,0)
Exceptional Children in the Schools: PR: Senior Standing or C.I. Characteristics, developmental patterns, educational problems, and appropriate educational programs for the exceptional child in Special Education.

EDEX 512 Qtr. Hrs. - 4 (4,0)
Educational Implications for the Speech and Language Disorders of Exceptional Children: PR: Senior Standing or C.I. Identification, evaluation, interpretation, and planning appropriage learning experiences to aid exceptional children with speech, hearing, and language disorders.

EDEX 513 Qtr. Hrs. - 4 (4,0)
Fundamental Concepts of Mental Retardation: PR: Senior standing or C.I. Characteristics, symptom groupings, diagnostic procedures, learning characteristics, and educational treatment procedures of the mentally retarded.

EDEX 514 Qtr. Hrs. - 4 (4,0)
Psycho-educational Appraisal of Exceptional Children: PR: Senior Standing or C.I. Selection of performance objectives, diagnostic measures, prescriptive teaching programs, and progress evaluation procedures for individualizing instruction.

EDEX 521 Qtr. Hrs. - 3 (3,0)
Classroom Organization for Teaching the Mentally Retarded: PR: Senior Standing, EDEX 514 or C.I. Special class organization, scheduling, utilizing materials, equipment; analysis of instructional procedures for teaching mentally retarded.

EDEX 522 Qtr. Hrs. - 3 (3,0)
Curriculum Planning Procedures for the Educable Mentally Retarded: PR: Senior Standing, EDEX 513 and EDEX 514 or C.I. Appropriate curriculum experiences and adjustments; media use; develop pre-vocational skills of educable mentally retarded children.

EDEX 523 Qtr. Hrs. - 3 (3,0)
Curriculum Planning Procedures for the Trainable Mentally Retarded: PR: Senior Standing, EDEX 513 and EDEX 514 or C.I. Curriculum experiences, media use, pre-vocational skills development for developmental levels of trainable mentally retarded children.

EDEX 611 Qtr. Hrs. - 3 (3,0)
Homemaking and Social Learning Skills for the Mentally Retarded: PR: Rank III Certificate or C.I. Personal development and management in clothing maintenance and repair, cooking, the use of hand tools, and homemaking tasks.

EDEX 612 Qtr. Hrs. - 3 (3,0)
Occupational and Educational Information for Exceptional Children: PR: Rank II Certificate or C.I. World-of-work overview, occupational areas, occupational skills required for habilitative and rehabilitative community agencies for exceptional children.

EDEX 621 Qtr. Hrs. - 3 (3,0)
Theories of Learning Disabilities of School Children: PR: Rank III Certificate or C.I. An introduction to etiology of learning disorders, with emphasis on environmental deprivation, sensory development, and other impairment.

EDEX 622 Qtr. Hrs. - 3 (3,0)
Instructional Diagnosis of the Learning Disabled Child: PR: Rank II Certificate or C.I. Evaluation techniques for diagnosing learning disabilities related to development in the basic school skills areas.

Rank I Certificate or C.I.

EDEX 623 Qtr. Hrs. - 3 (3,0)
Individualized and Prescriptive Instruction for the Learning Disabled Child: PR: Study of program innovations and prescriptive programming for pupils with learning disabilities.

EDEX 624 Qtr. Hrs. - 3 (3,0)
Behavior Management Techniques with Ex
Children: PR: Rank III Certificate or C.I. Study of pupil management techniques, including group and individual procedures, for modifying the learning behavior of exceptional pupils.

Introduction to Guidance in Schools
PR Completion of Phase II Educ. Prof. Prep. or Rank III or C.I. Basic course

EDUCATION – GUIDANCE

EDGU 511 presenting overview 4(4,0)

EDGU 612 philosophy, organization Qtr. Hrs. - 4
Vocational and Career Development Procedures: PR: Rank III Certificate. Review of the forces which affect career choice and shape personal development. Emphasis on vocational counseling, career education, and parent-student-school interrelationships in making decisions.

EDGU 613 Qtr. Hrs. - 4
Group Procedures in School Guidance Counseling: PR: Rank III Certificate, EDGU 511 or EDGU 615, or C.I. Nature, theory, process of group counseling including study of dynamics related to change in values and behavior of children and adolescents; class demonstration and practice.

EDGU 614 Qtr. Hrs. - 5
Counseling Practicum in Schools: PR: Rank III Certificate, EDGU 511, 613, 615 or C.I. Supervised counseling emphasizing competence in (1) individual counseling; (2) working with groups; (3) tests in educational-vocational-personal counseling.

EDGU 615 Qtr. Hrs. - 4
Theories and Techniques of Individual School Counseling: PR: EDGU 511 or C.I. Major theories and approaches to school counseling, correlating them with counterpart theories of personality and learning.

administration and operation of guidance & pupil personnel services in the schools.

EDEL 621 Qtr. Hrs. - 3 (3,0)
Diagnosis of Difficulties in Elementary School Mathematics: PR: EDEL 620. Study and uses of tests regarding the symptoms and causes of specific learning skills in mathematics.

EDEL 622 Qtr. Hrs. - 3 (3,0)
Remediation of Difficulties in Elementary School Mathematics: PR: EDEL 621. Selection of materials and techniques for a remedial program based on individual diagnosis.

EDEL 630 Qtr. Hrs. - 3 (3,0)
Trends in Elementary School Reading Education: PR: Rank III Certificate or C.I. Analysis of historical development and current trends in reading research.

EDEL 632 Qtr. Hrs. - 3 (3,0)
Corrective Reading for Classroom Teachers I: PR: EDEL 535 or equivalent. A practicum for classroom teachers with emphasis on group diagnostic reading tests and classroom corrective techniques.

EDEL 633 Qtr. Hrs. - 3 (3,0)
Corrective Reading for Classroom Teachers II: PR: EDEL 632 or equivalent. A continuation of EDEL 632.

EDEL 635 Qtr. Hrs. - 3 (3,0)
Diagnosis of Difficulties in Reading: PR: EDEL 535 or equivalent. Administration and interpretation of individual tests. Consideration of physical, psychological and environmental factors contributing to reading difficulties.

EDEL 636 Qtr. Hrs. - 4 (4,0)
Diagnostic Reading Practicum: PR: EDEL 635 or equivalent. Evaluation of reading abilities and difficulties of children in the reading laboratory of the University. Preparation of individual case reports.

EDEL 637 Qtr. Hrs. - 4 (4,0)
Remedial Reading Practicum: PR or CR: EDEL 636. Supervised remedial instruction with individual children. Selection of instructional materials and techniques; preparation of case progress reports; parent interviews.

EDEL 640 Qtr. Hrs. - 3 (3,0)
Trends in Elementary School Language Arts Education: PR: Rank III Certificate or C.I. Analysis of historical development and current trends in language arts research.

EDEL 641 Qtr. Hrs. - 3 (3,0)
Investigation in Children's Literature: PR: Rank III Certificate or C.I. Analysis of the various approaches available for learning through the utilization of children's literature.

EDEL 650 Qtr. Hrs. - 3 (3,0)

EDGU 511
4(4,0)
INTRODUCTION TO GUIDANCE IN SCHOOLS: PR: Completion of Phase II of Educ. Prof. Prep. or Rank III or C.I.. A basic course presenting an overview of the philosophy, organization, administration and operation of guidance and pupil personnel services in the schools.

EXCEPTIONAL CHILD EDUCATION

EDEX 511 Qtr. Hrs. - 4 (4,0)
Exceptional Children in the Schools: PR: Senior Standing or C.I. Characteristics, developmental patterns, educational problems, and appropriate educational programs for the exceptional child in Special Education.

EDEX 512 Qtr. Hrs. - 4 (4,0)
Educational Implications for the Speech and Language Disorders of Exceptional Children: PR: Senior Standing or C.I. Identification, evaluation, interpretation, and planning appropriage learning experiences to aid exceptional children with speech, hearing, and language disorders.

EDEX 513 Qtr. Hrs. - 4 (4,0)
Fundamental Concepts of Mental Retardation: PR: Senior standing or C.I. Characteristics, symptom groupings, diagnostic procedures, learning characteristics, and educational treatment procedures of the mentally retarded.

EDEX 514 Qtr. Hrs. - 4 (4,0)
Psycho-educational Appraisal of Exceptional Children: PR: Senior Standing or C.I. Selection of performance objectives, diagnostic measures, prescriptive teaching programs, and progress evaluation procedures for individualizing instruction.

EDEX 521 Qtr. Hrs. - 3 (3,0)
Classroom Organization for Teaching the Mentally Retarded: PR: Senior Standing, EDEX 514 or C.I. Special class organization, scheduling, utilizing materials, equipment; analysis of instructional procedures for teaching mentally retarded.

EDEX 522 Qtr. Hrs. - 3 (3,0)
Curriculum Planning Procedures for the Educable Mentally Retarded: PR: Senior Standing, EDEX 513 and EDEX 514 or C.I. Appropriate curriculum experiences and adjustments; media use; develop pre-vocational skills of educable mentally retarded children.

EDEX 523 Qtr. Hrs. - 3 (3,0)
Curriculum Planning Procedures for the Trainable Mentally Retarded: PR: Senior Standing, EDEX 513 and EDEX 514 or C.I. Curriculum experiences, media use, pre-vocational skills development for developmental levels of trainable mentally retarded children.

EDEX 611 Qtr. Hrs. - 3 (3,0)
Homemaking and Social Learning Skills for the Mentally Retarded: PR: Rank III Certificate or C.I. Personal development and management in clothing maintenance and repair, cooking, the use of hand tools, and homemaking tasks.

EDEX 612 Qtr. Hrs. - 3 (3,0)
Occupational and Educational Information for Exceptional Children: PR: Rank II Certificate or C.I. World-of-work overview, occupational areas, occupational skills required for habilitative and rehabilitative community agencies for exceptional children.

EDEX 621 Qtr. Hrs. - 3 (3,0)
Theories of Learning Disabilities of School Children: PR: Rank III Certificate or C.I. An introduction to etiology of learning disorders, with emphasis on environmental deprivation, sensory development, and other impairment.

EDEX 622 Qtr. Hrs. - 3 (3,0)
Instructional Diagnosis of the Learning Disabled Child: PR: Rank II Certificate or C.I. Evaluation techniques for diagnosing learning disabilities related to development in the basic school skills areas.

Rank I Certificate or C.I.

EDEX 623 Qtr. Hrs. - 3 (3,0)
Individualized and Prescriptive Instruction for the Learning Disabled Child: PR: Study of program innovations and prescriptive programming for pupils with learning disabilities.

EDEX 624 Qtr. Hrs. - 3 (3,0)
Behavior Management Techniques with Ex
Children: PR: Rank III Certificate or C.I. Study of pupil and individual
ior of exceptional

schools;
Prof. Prep. or
4(4,0)

EDGU 612 Philosophy, organization Qtr. Hrs. - 4
Vocational and Career Development Procedures: PR: Rank III Certificate. Review of the forces which affect career choice and shape personal development. Emphasis on vocational counseling, career education, and parent-student-school interrelationships in making decisions.

EDGU 613 Qtr. Hrs. - 4
Group Procedures in School Guidance Counseling: PR: Rank III Certificate, EDGU 511 or EDGU 615, or C.I. Nature, theory, process of group counseling including study of dynamics related to change in values and behavior of children and adolescents; class demonstration and practice.

EDGU 614 Qtr. Hrs. - 5
Counseling Practicum in Schools: PR: Rank III Certificate, EDGU 511, 613, 615 or C.I. Supervised counseling emphasizing competence in (1) individual counseling; (2) working with groups; (3) tests in educational-vocational-personal counseling.

EDGU 615 Qtr. Hrs. - 4
Theories and Techniques of Individual School Counseling: PR: EDGU 511 or C.I. Major theories and approaches to school counseling, correlating them with counterpart theories of personality and learning.

administration and operation of guidance & pupil personnel services in the schools.

LIBRARY SCIENCE

EDLS 301 Qtr. Hrs. - 4 (4,0)
Foundations of Librarianship: PR: C.I. Survey of libraries and librarianship, origin, services, problems and current library literature. Library services on all levels and related terminology.

EDLS 321 Qtr. Hrs. - 4 (4,0)
Media Center Organization and Operation: PR: C.I. Principles in organizing library collections of books and non-book materials. Circulation of materials, statistical records and maintenance of collections in school media centers.

EDLS 380 Qtr. Hrs. - 3 (3,0)
Library Resources and Materials: Use of the library, basic reference material, library services and research methods.

EDLS 421 Qtr. Hrs. - 4 (4,0)
Administration of the Library Media Center: PR: EDLS 301. Principles and practices of administration applied to elementary and secondary school library media centers. Methods of teaching the use of the library.

EDLS 431 Qtr. Hrs. - 4 (4,0)
Cataloging and Classification: PR: EDLS 301. Cataloging and classification of library materials. Practical problems in descriptive cataloging, subject cataloging and the Dewey Decimal Classification as practiced in school media centers.

EDLS 441 Qtr. Hrs. - 4 (4,0)
Reference Materials and Services: PR: C.I. Selection, evaluation and use of basic print and non-print reference materials.

EDLS 451 Qtr. Hrs. - 4 (4,0)
Utilization of Educational Media: PR: C.I. Principles and practices of communication theory and its application in the classroom. Emphasis on utilization and operation of the various classroom media.

EDLS 452 Qtr. Hrs. - 4 (4,0)
Instructional Media Producation: PR: EDLS 451. Selection, evaluation and production of instructional materials with emphasis on projected materials, display and presentation techniques.

EDLS 521 Qtr. Hrs. - 4 (4,0)
Administrative Principles in Media Centers: PR: EDLS 321. Planning, organizing, directing, supervising and budgeting in school media centers. Personnel, public relations, and evaluating services. Planning buildings including equipment and furniture.

EDLS 531 Qtr. Hrs. - 4 (4,0)
Non-Book Materials: PR: EDLS 431. The function, evaluation, selection, preparation for use, cataloging and preservation of non-book materials.

ESLS 532 Qtr. Hrs. - 4 (4,0)
Acquisition of Library Materials: PR: EDLS 321 or C.I. Evaluation, selecting, and acquiring book and non-book materials. Selecting aids, reviewing media, publishers and jobbers. Procedures for budgeting, final records, gifts and exchanges.

EDLS 541 Qtr. Hrs. - 4 (4,0)
Government Publications: PR: EDLS 441. United States government publications, state and international documents. Selection, acquisition and use as sources of information for school media centers.

EDLS 551 Qtr. Hrs. - 4 (4,0)
Instructional Technology and the Curriculum: PR: EDLS 451. Use and selection of instructional materials as they apply to the curriculum in elementary and secondary schools.

EDLS 611 Qtr. Hrs. - 4 (4,0)
Seminar In Library Media: PR: EDLS 421, EDLS 431, and EDLS 441. Problems in the development of collections for children and young people, reluctant readers and the non-reader. Controversial aspects of book selection and censorship.

EDLS 641 Qtr. Hrs. - 4 (4,0)
Reference Sources: PR: EDLS 441. Selection, evaluation and use of advanced and specialized reference materials in various subject fields.

MUSIC EDUCATION

EDME 401 Qtr. Hrs. - 2 (2,0)
Elementary School Music Instructional Analysis: PR: EDTA 206 and EDTA 307. Instructional planning, sources of information, instructional techniques, evaluation, and organizational and administrative procedures in the elementary school music program.

EDME 402 Qtr. Hrs. - 2 (2,0)
Secondary School Music Instructional Analysis: PR: EDTA 206 and EDTA 307. Instructional planning, teaching techniques, evaluation procedures, sources of information and current trends in the general music program for middle, junior and senior high schools.

EDME 403 Qtr. Hrs. - 2 (2,0)
Instrumental Music Instructional Analysis: PR: EDTA 206 and EDTA 307. Organization and administration of the instrumental music program; sources of information, instructional aids and materials, rehearsal procedures, conducting techniques, evaluation procedures, and performance considerations.

EDME 404 Qtr. Hrs. - 2 (2,0)
Vocal Music Instructional Analysis: PR: EDTA 206 and EDTA 307. Organization and administration of the vocal music program; sources of information, instructional materials, rehearsal procedures, conducting techniques, evaluation procedures, and performance considerations.

PHYSICAL EDUCATION — DEVELOPMENTAL

EDPE 323 Qtr. Hrs. - 2 (1,1)
Instructional Analysis in Team Sports: PR: Sophomore standing. Analysis of neuromuscular performances and optimal approach to specific learning patterns in team sports.

EDPE 324 Qtr. Hrs. - 2 (1,1)
Instructional Analysis in Tennis: PR: Sophomore standing. Mechanical analysis of neuromuscular performances and optimal approach to specific motor learning patterns.

EDPE 325 Qtr. Hrs. - 2 (1,1)
Instructional Analysis in Aquatics: PR: Sophomore standing. Mechanical analysis of neuromuscular performances and optimal approach to specific motor learning patterns.

EDPE 326 Qtr. Hrs. - 2 (1,1)
Instructional Analysis in Gymnastics and Tumbling: PR: Sophomore standing. Mechanical analysis of neuromuscular performances and optimal approach to specific motor learning patterns.

EDPE 327 Qtr. Hrs. - 2 (1,1)
Instructional Analysis in Golf: PR: Sophomore standing. Mechanical analysis of neuromuscular performances and optimal approach to specific learning patterns.

EDPE 328 Qtr. Hrs. - 2 (1,1)
Instructional Analysis in Wrestling (M): PR: Sophomore standing. Mechanical analysis of neuromuscular performances and optimal approach to specific learning patterns.

EDPE 329 Qtr. Hrs. - 2 (1,1)
Choreography of Contemporary Dance (W): PR: Sophomore standing. Dance production as an art form.

EDPE 330 Qtr. Hrs. - 2 (1,1)
Instructional Analysis of Rhythmics: PR: Sophomore standing. Analysis of rhythm and rhythmic activities as they relate to teaching physical education.

EDPE 350 Qtr. Hrs. - 3 (2,1)
Coaching Theory: PR: EDPE 323. Theory and methods of coaching for optimum sports performance.

EDPE 360 Qtr. Hrs. - 3 (2,1)
School and Community Recreation: PR: Admission to Phase II or C.I. Knowledge and skills of after school activity and summer recreational programs.

~~EDPE 407 Qtr. Hrs. - 5 (5,0)~~
~~Family Living Concepts: The ideas and principles of healthy family living.~~

~~EDPE 408 Qtr. Hrs. - 5 (5,0)~~
~~Contemporary Health Hazards: The effects of drugs and other mood modifiers.~~

EDPE 410 Qtr. Hrs. - 3 (2,2)
Kinesiomechanics: PR: ZOOL 224. Mechanics of human movement. Anatomical and mechanical analysis of motor tasks and individual performance. Laboratory experience in analytical and evaluative methods.

EDPE 421 Qtr. Hrs. - 4 (2,2)
Exercise Physiology - Cardiovascular: PR: ZOOL 224. A circulatory study of man's homeostatic regulation during environmental stress. (Includes lecture and laboratory.)

EDPE 422 Qtr. Hrs. - 4 (2,2)
Exercise Physiology - Respiratory: PR: ZOOL 224 and EDPE 421. A study of metabolic costs and respiratory adjustment to exercise.

EDPE 430 Qtr. Hrs. - 4 (2,3)
Human Performance Learning: PR: EDTA 306 or equivalent. Theories of movement and factors influencing the learning of gross and fine motor skills. (Includes lecture and laboratory.)

EDPE 440 Qtr. Hrs. - 3 (2,1)
Rehabilitation Training Techniques: PR: EDPE 410. Recognition and rehabilitation of sports injuries, including first aid.

EDPE 441 Qtr. Hrs. - 3 (2,1)
Adapted Physical Education: PR: EDPE 410 and EDPE 422. Principles and methods for adapting physical education activities and programs for atypical participants. Nature of typical specific disabilities.

EDPE 450 Qtr. Hrs. - 3 (3,0)
Organization and Administration of Physical Education: PR: EDSE 380 or EDEL 318. Administering and organizing for instruction of the physical education class and the total school physical education program.

EDPE 590 Qtr. Hrs. - 3 (3,0)
Measurement in Kinesiology and Physical Education: PR: Rank III Certificate or C.I. Techniques of measurement and evaluation of human physical performance and their applications to physical education.

EDPE 601 Qtr. Hrs. - 3 (3,0)
Philosophical Foundations of Physical Education: PR: Rank III Certificate or C.I. Analysis of the forces and events leading to the development of current concepts in physical education.

EDPE 602 Qtr. Hrs. - 3 (3,0)
Current Trends in Physical Education: PR: Rank III Certificate or C.I. A comprehensive review of the literature influencing trends in physical education.

EDPE 603 Qtr. Hrs. - 3 (3,0)
Organization and Design of Physical Education Programs: PR: Rank III Certificate or C.I. Study of physical education and its existing organization. Emphasis on ethics, values, principles and issues.

EDPE 604 Qtr. Hrs. - 3 (3,0)
Administration in Physical Education: PR: Rank III Certificate or C.I. Study of current problems in the administration of school physical education programs.

EDPE 621 Qtr. Hrs. - 5 (3,2)
Physiology of Exercise — Environmental: PR: Rank III Certificate or C.I. A study of physiological adaptation resulting from prescribed physical activity programs.

EDPE 624 Qtr. Hrs. - 3 (2,1)
Rhythmics: PR: Rank III Certificate or C.I. Instructional analysis in classical and modern rhythms.

EDPE 631 Qtr. Hrs. - 5 (3,2)
Motor Learning: PR: Rank III Certificate or C.I. A study of optimal human factors controlling performance.

EDPE 632 Qtr. Hrs. - 3 (2,1)
Perceptual Motor Development: PR: EDTA 614 or C.I. Study of the relationship between perceptual motor development and learning. Evaluation of physical activities designed to improve perceptual motor skills.

EDPE 660 Qtr. Hrs. - 3 (3,0)
School Recreation: PR: Rank III Certificate or C.I. A study of recreational programs related to the public schools.

EDPE 680 Qtr. Hrs. - 3 (2,1)
Kinesiologic Analysis of Individual Activities: PR: Rank III Certificate or C.I. Analytical techniques of kinesiology and their methods of application to individual motor activities.

EDPE 681 Qtr. Hrs. - 3 (2,1)
Kinesiologic Analysis of Team Activities: PR: Rank III Certificate or C.I. Analytical techniques of kinesiology and their methods of application to team motor activities.

PROFESSIONAL LABORATORY — APPLICATION

EDPL 320 Qtr. Hrs. - 3 (0,6)
Elementary School Student Teaching - Block A: PR: EDTA 206 and EDTA 307. Junior year student teaching in an elementary school under the supervision of a certified classroom teacher.

EDPL 321 Qtr. Hrs. - 3 (0,6)
Elementary School Student Teaching - Block B: PR: EDPL 320. Junior year student teaching in an elementary school under the supervision of a certified classroom teacher.

EDPL 330 Qtr. Hrs. - 3 (0,6)
Secondary School Student Teaching - Block A: PR: EDTA 206 and EDTA 307. Junior year student teaching in a secondary school under the supervision of a certified classroom teacher.

EDPL 408 Qtr. Hrs. - 3 (0,6)
Teaching Strategies: PR: Admission to Phase III. Seminar taken concurrently with student teaching exploring class management, aspects of professional and personal development, and current school problems and possible solutions.

EDPL 421 Qtr. Hrs. - 9 (0,18)
Elementary School Student Teaching - Block C: PR: EDPL 321. Senior year student teaching in an elementary school under the supervision of a certified classroom teacher.

EDPL 430 Qtr. Hrs. - 9 (0,18)
Secondary School Student Teaching - Block C: PR: EDPL 330. Senior year student teaching in a secondary school under the direction of a certified classroom teacher.

EDPL 551 Qtr. Hrs. - 1-12 (0, 1-12)
Supervised Teaching Practicum with Exceptional Children: PR: Bachelor's degree, approved program, and C.I. Supervised observation and teaching under the direction of a properly certified exceptional child teacher.

EDPL 558 Qtr. Hrs. - 4 (3,1)
Supervision of Professional Laboratory Experiences: PR: C.I. Study of the undergraduate professional laboratory experiences program with emphasis on the role and responsibilities of the Teacher Education Associate or Supervising Teacher.

SECONDARY EDUCATION — DEVELOPMENTAL

EDSE 303 Qtr. Hrs. - 3 (3,0)
School Programs: PR: EDTA 206 and EDTA 307. A study of the public school curriculum, kindergarten through grade twelve.

EDSE 305 Qtr. Hrs. - 3 (3,0)
Secondary School Curriculum: PR: EDTA 206 and EDTA 307. Study of total school patterns with emphasis on new trends, including subject areas, administration, supervision, school services and school related activities.

EDSE 310 Qtr. Hrs. - 4 (3,2)
Speech Instructional Analysis: PR: EDTA 206 and EDTA 307. Study of instructional programs in speech; objectives, materials, techniques, organization for instruction, evaluation procedures, current research.

EDSE 320 Qtr. Hrs. - 3 (3,1)
Foreign Language as Human Behavior: PR or CR: ENG 371 or C.I. Nature of language, objectives of foreign language learning and introduction to teaching basic skills. One hour laboratory required each week.

EDSE 321 Qtr. Hrs. - 4 (3,2)
Foreign Language Instructional Analysis: PR: EDTA 206 and EDTA 307. Study of course objectives for the high school curriculum and survey of methods and materials having special application for teaching foreign language.

EDSE 330 Qtr. Hrs. - 4 (3,2)
Business Instructional Analysis I: PR: EDTA 206 and EDTA 307. Techniques, materials, and instructional media; psychological principles, evaluation, and current trends in typewriting instruction.

EDSE 340 Qtr. Hrs. - 4 (3,2)
English Instructional Analysis: PR: EDTA 206 and EDTA 307. Study of course objectives for the high school curriculum and survey of methods and materials which have special application for teaching English.

EDSE 350 Qtr. Hrs. - 4 (3,2)
Mathematics Instructional Analysis: PR: EDTA 206 and EDTA 307. Study of course objectives for the high school curriculum and survey of methods and materials which have special application for teaching mathematics.

EDSE 360 Qtr. Hrs. - 4 (3,2)
Science Instructional Analysis: PR: EDTA 206 and EDTA 307. Study of course objectives for the high school curriculum and survey of methods and materials which have special application for teaching science.

EDSE 370 Qtr. Hrs. - 4 (3,2)
Social Science Instructional Analysis: PR: EDTA 206 and EDTA 307. Study of instructional programs in Social Sciences; objectives; materials; techniques; organization of instruction; evaluation procedures; current research.

EDSE 380 Qtr. Hrs. - 4 (3,2)
Physical Education Instructional Analysis: PR: EDTA 206 and EDTA 307. Study of course objectives for the high school curriculum and survey of methods and materials having special application for teaching physical education.

EDSE 404 Qtr. Hrs. - 3 (3,0)
Instructional Techniques: PR: EDPL 330, CR: EDPL 408 and EDPL 430. Procedures, applications and evaluation of technical skills a teacher may employ in the classroom.

EDSE 421 Qtr. Hrs. - 3 (3,1)
Oral Teaching of Foreign Languages: PR: EDPL 330 or C.I. Audio-lingually-based demonstration class. Practice in linguistic methods. One hour laboratory required each week.

EDSE 431 Qtr. Hrs. - 3 (3,0)
Business Instructional Analysis II: PR: EDTA 206 and EDTA 307. Techniques, materials, and instructional media; psychological principles, evaluation and current trends in shorthand and related instruction.

EDSE 432 Qtr. Hrs. - 3 (3,0)
Business Instructional Analysis III: PR: EDTA 206 and EDTA 307. Techniques, materials, and instructional media; psychological principles, evaluation, and current trends in accounting and basic business instruction.

EDSE 440 Qtr. Hrs. - 3 (3,0)
Teaching Language and Composition: PR: EDTA 206 and EDTA 307. Techniques and methods in teaching of dialects, semantics, the various grammars. A survey of composition and rhetorical methods of selected authors.

EDSE 441 Qtr. Hrs. - 3 (3,0)
Literature for Adolescents: PR: Senior standing or C.I. Selecting and evaluating books for adolescents with emphasis on the uses of literature in the development of young people.

EDSE 442 Qtr. Hrs. - 4 (4,0)
Reading in the Secondary School: PR: Senior standing or C.I. Developmental reading for the junior and senior high school pupil.

EDSE 461 Qtr. Hrs. - 3 (1,4)
Biology Laboratory Teaching: PR: Senior standing. Participation in introductory level chemistry laboratory. Includes laboratory set-ups, laboratory staff meetings and a weekly seminar.

EDSE 462 Qtr. Hrs. - 2 (1,3)
Chemistry Laboratory Teaching: PR: Senior standing. Participation in introductory level chemistry laboratory. Includes laboratory set-ups, laboratory staff meetings and a weekly seminar.

EDSE 463 Qtr. Hrs. - 2 (1,3)
Chemistry Laboratory Teaching: PR: EDSE 462. Continuation of EDSE 462.

EDSE 464 Qtr. Hrs. - 2 (1,3)
Physics Laboratory Teaching: PR: Senior standing. Participation in introductory level physics laboratory. Includes laboratory set-ups, laboratory staff meetings and a weekly seminar.

EDSE 465 Qtr. Hrs. - 2 (1,3)
Physics Laboratory Teaching: PR: EDSE 464. Continuation of EDSE 464.

EDSE 471 Qtr. Hrs. - 3 (3,0)
Trends in Secondary School Social Science: PR: Senior standing. Identification, development and evaluation of major social science concepts as they relate to contemporary school programs.

EDSE 521 Qtr. Hrs. - 3 (3,0)
Media and Research in Foreign Language Teaching: PR: Rank III Certificate or C.I. Rationale and use of technological aides in foreign language teaching, classroom research and evaluation.

EDSE 541 Qtr. Hrs. - 4 (4,0)
Media and Methods in English Education: PR: Rank III Certificate or C.I. Practicum in the use of various media in the English classroom with emphasis on student film making and production of media.

EDSE 552 Qtr. Hrs. - 3 (3,0)
Laboratory Programs in Mathematics: PR: Rank III Certificate or C.I. Design, organization and development of special materials and projects for mathematics independent study.

EDSE 551 Qtr. Hrs. - 3 (3,0)
Topics in Junior High School Mathematics: PR: Rank III Certificate or C.I. Instructional techniques and major problems in junior high mathematics programs.

EDSE 561 Qtr. Hrs. - 3(3,0)
Inquiry in the Sciences: PR: Rank III Certificate or C.I. The techniques in teaching science by inquiry in the secondary school with the opportunity to participate in and develop inquiry lessons.

EDSE 562 Qtr. Hrs. - 3 (3,0)
High School Biology Concepts: PR: Rank III Certificate or C.I. Major concepts in BSCS biology and other modern biology programs.

EDSE 571 Qtr. Hrs. - 3 (3,0)
Inquiry in the Social Studies: PR: Rank III Certificate or C.I. An in-depth development of the role of inquiry in the new social studies with opportunity both to participate in and to develop inquiry episodes.

EDSE 601 Qtr. Hrs. - 3 (3,0)
Nature and Theory of Curriculum: PR: Rank III Certificate or C.I. Philosophical and psychological basis for American education and the implications for curricular decision-making.

EDSE 602 Qtr. Hrs. - 3 (3,0)
Patterns of Curriculum and Instruction: PR: Rank III Certificate or C.I. An analysis of exemplary secondary school programs and instructional procedures.

EDSE 611 Qtr. Hrs. - 5 (5,0)
Secondary School Instructional Programs: PR: Rank III Certificate or C.I. Analysis of the forces which shape and contribute to the vertical and horizontal curriculum designs of secondary schools.

EDSE 621 Qtr. Hrs. - 3 (3,0)
Trends in School Foreign Language Programs: PR: Rank III Certificate or C.I. Development, articulation and innovations in foreign language curriculums.

EDSE 622 Qtr. Hrs. - 3 (3,0)
Linguistic Analysis in Teaching Foreign Languages: PR: Rank III Certificate or C.I. Linguistic aspects of foreign language learning. Applied linguistics and psycholinguistics in language teaching.

EDSE 641 Qtr. Hrs. - 3 (3,0)
English Programs in the Secondary School: PR: Rank III Certificate or C.I. Concepts, problems, and advanced topics in such programs as Project English and other secondary school English projects.

EDSE 642 Qtr. Hrs. - 3 (3,0)
Reading Guidance for Adolescents: PR: Rank III Certificate or C.I. Review of literary works appropriate for young people to provide insight into psychological problems common to teenagers.

EDSE 651 Qtr. Hrs. - 3 (3,0)
Secondary School Mathematics Programs: PR: Rank III Certificate or C.I. Major concepts in SMSG mathematics and other modern junior, senior and middle school programs.

EDSE 652 Qtr. Hrs. - 3 (3,0)
Seminar in Mathematics Teaching: PR: Rank III Certificate or C.I. A review of prominent research and the writings of selected authors in mathematics education.

EDSE 661 Qtr. Hrs. - 3 (3,0)
Intermediate School Science Programs: PR: Rank III Certificate or C.I. Basic concepts, philosophies, and formats of experimental middle and junior high school science programs.

EDSE 662 Qtr. Hrs. - 3 (3,0)
Laboratory Programs in Science Education: PR: Rank III Certificate or C.I. Design, organization and development of special materials and projects for science independent study centers.

EDSE 671 3(3,0)

EDSE 672 Qtr. Hrs. - 3 (3,0)
Contemporary Social Science Education: PR: Rank III Certificate or C.I. A survey of recent developments and contemporary programs in all areas of the social sciences.

EDSE 671
LABORATORY PROGRAMS IN THE SOCIAL SCIENCES: PR: EDSE 571 or C.I. Design, organization and development of special materials related to selected conceptual specializations. 3(3,0)

applications in growth and learning from conception ... adolescence. EDTA 307 recommended concurrently.

EDTA 305 Qtr. Hrs. - 3 (3,0)
Principles of Evaluation: PR: Successful completion of Teaching Analysis (EDTA 307), and Human Development (EDTA 206). Principles of evaluation applied to advising pupils, diagnosing learning deficiencies, determining effectiveness of instruction and judging pupil progress.

EDTA 306 Qtr. Hrs. - 3 (3,0)
Variables Affecting School Learning: PR: Successful completion of Phase I. Study of learning principles affecting classroom teaching/learning with particular attention to those most relevant to teacher/student interaction.

EDTA 307 Qtr. Hrs. - 5 (3,2)
Teaching Analysis: Initial requirement; an opportunity to examine and participate in general and specific dimensions of teaching with socio-economic factors emphasized. EDTA 206 recommended concurrently.

EDTA 480 Qtr. Hrs. - 3 (3,0)
Overview of Education: Study of public education in the United States focusing on the development of structure and process in the educational enterprise.

EDTA 481 Qtr. Hrs. - 3 (3,0)
Trends and the Future of Education: Identification of trends and postulations concerning the future of education and formulation of criteria for appraisal of innovations in education.

EDTA 490 Qtr. Hrs. - 2 (2,0)
Senior Seminar: Education in Human Affairs: Provides an overview of basic objectives, strategies, and techniques in education. This course, primarily intended for the senior student, is offered as one of the advanced Environmental Studies Seminars. Not open to the student enrolled in the College of Education.

EDTA 601 Qtr. Hrs. - 3 (3,0)
Fundamental Research Procedures in Education: PR: Rank III Certificate or C.I. Design rationale and construction, sampling methods, control and limits.

EDTA 611 Qtr. Hrs. - 3 (3,0)
Social Factors in American Education: PR: Rank III Certificate or C.I. Analysis of general and specific aspects of American education as they relate to Social and Behavioral Sciences.

EDTA 612 Qtr. Hrs. - 3 (3,0)
Measurement and Evaluation in Education: PR: Rank III Certificate or C.I. Rationale and construction of evaluative instruments, parametric and non-parametric statistics, interpretation of data.

EDTA 613 Qtr. Hrs. - 3 (3,0)
Behavior Problems in the Public School: PR: Rank III Certificate or C.I. Role of the teacher in identification, strategies for remediation and referral procedures for working with behavioral problem children. Mental hygiene principles stressed.

EDTA 614 Qtr. Hrs. - 3 (3,0)
Studies in Human Development and Childhood: PR: Rank III Certificate or C.I. Recent research in Human Development and childhood relevant to contemporary American education. Emphasis prenatal through age 11.

EDTA 615 Qtr. Hrs. - 3 (3,0)
Studies in Teaching Analysis: PR: Rank III Certificate or C.I. Usage and analysis of micro-teaching, verbal and non-verbal approaches, social and behavioral variables influencing classroom learning.

EDTA 616 Qtr. Hrs. - 3 (3,0)
Techniques of Game Use in Education: PR: Rank III Certificate or C.I. Analysis, development, and use of educational games as an approach to classroom teaching.

EDTA 617 Qtr. Hrs. - 3 (3,0)
Adolescent Development and the Schools: PR: Rank III Certificate or C.I. Recent research in human development in adolescence with special emphasis upon research of interest to secondary school teachers.

EDTA 618 Qtr. Hrs. - 3 (3,0)
Instructional Models and Learning Theories in Education: PR: ... C.I. Recent research and theoretical ... rning

EDUCATION – VISUAL ARTS

EDVA 401 Qtr. Hrs. - 3 (3,0)
Elementary School Art Instructional Analysis: PR: EDTA 206 and EDTA 307 or C.I. Methods and curriculum materials appropriate for teaching Visual Arts in the elementary schools.

EDVA 402 Qtr. Hrs. - 3 (3,0)
Secondary School Art Instructional Analysis: PR: EDTA 206 and EDTA 307 or C.I. Methods and curriculum materials for teaching Visual Arts in the secondary schools.

EDVA 431 Qtr. Hrs. - 5 (5,0)
Two-Dimensional Instructional Materials: PR: EDVA 401 or EDVA 402 or C.I. Application of two-dimensional materials to appropriate levels of instruction: chalk, ink, water color, crayon, tempera, acrylics, paper, fiber, and oils.

EDVA 432 Qtr. Hrs. - 5 (5,0)
Three-Dimensional Instructional Materials: PR: EDVA 401 or EDVA 402 or C.I. Application of three-dimensional materials to appropriate levels of instruction: wood, paper, plaster, stone, clay, wax, fiber, metal, and synthetics.

EDVA 433 Qtr. Hrs. - 5 (5,0)
Graphic Instructional Materials: PR: EDVA 401 or EDVA 402 or C.I. Application of graphic materials to appropriate level of instruction: direct and indirect basic processes of reproduction of mono and multi-printing.

EDVA 501 Qtr. Hrs. - 3 (3,0)
Contemporary Visual Arts Education: PR: EDVA 401 and EDVA 402 or C.I. A study of current programs and innovations in public school Visual Arts Programs.

EDVA 502 Qtr. Hrs. - 3 (3,0)
Found Arts: PR: EDVA 431 and EDVA 432 or C.I. Materials available for instruction in the public schools will be explored in depth in relation to their appropriateness and productive qualities.

EDVA 601 Qtr. Hrs. - 3 (3,0)
Two-Dimensional Instructional Materials: PR: EDVA 401, EDVA 402, and EDVA 431, or C.I. Application of two-dimensional materials to appropriate levels of instruction: chalk, ink, water color, crayon, tempera, acrylics, paper, fiber, and oils.

EDVA 602 Qtr. Hrs. - 3 (3,0)
Three-Dimensional Instructional Materials: PR: EDVA 401, EDVA 402, and EDVA 432, or C.I. Application of three-dimensional materials to appropriate levels of instruction: wood, paper, plaster, stone, clay, wax, fiber, metal, and synthetics.

EDSE 642 Qtr. Hrs. - 3 (3,0)
Reading Guidance for Adolescents: PR: Rank III Certificate or C.I. Review of literary works appropriate for young people to provide insight into psychological problems common to teenagers.

EDSE 651 Qtr. Hrs. - 3 (3,0)
Secondary School Mathematics Programs: PR: Rank III Certificate or C.I. Major concepts in SMSG mathematics and other modern junior, senior and middle school programs.

EDSE 652 Qtr. Hrs. - 3 (3,0)
Seminar in Mathematics Teaching: PR: Rank III Certificate or C.I. A review of prominent research and the writings of selected authors in mathematics education.

EDSE 661 Qtr. Hrs. - 3 (3,0)
Intermediate School Science Programs: PR: Rank III Certificate or C.I. Basic concepts, philosophies, and formats of experimental middle and junior high school science programs.

EDSE 662 Qtr. Hrs. - 3 (3,0)
Laboratory Programs in Science Education: PR: Rank III Certificate or C.I. Design, organization and development of special materials and projects for science independent study centers.

EDSE 671 3(3,0)

EDSE 672 Qtr. Hrs. - 3 (3,0)
Contemporary Social Science Education: PR: Rank III Certificate or C.I. A survey of recent developments and contemporary programs in all areas of the social sciences.

TEACHING ANALYSIS

EDTA 206 Qtr. Hrs. - 3 (3,0)
Human Development: Analysis of basic principles and applications in growth and learning from conception through adolescence. EDTA 307 recommended concurrently.

EDTA 305 Qtr. Hrs. - 3 (3,0)
Principles of Evaluation: PR: Successful completion of Teaching Analysis (EDTA 307), and Human Development (EDTA 206). Principles of evaluation applied to advising pupils, diagnosing learning deficiencies, determining effectiveness of instruction and judging pupil progress.

EDTA 306 Qtr. Hrs. - 3 (3,0)
Variables Affecting School Learning: PR: Successful completion of Phase I. Study of learning principles affecting classroom teaching/learning with particular attention to those most relevant to teacher/student interaction.

EDTA 307 Qtr. Hrs. - 5 (3,2)
Teaching Analysis: Initial requirement; an opportunity to examine and participate in general and specific dimensions of teaching with socio-economic factors emphasized. EDTA 206 recommended concurrently.

EDTA 480 Qtr. Hrs. - 3 (3,0)
Overview of Education: Study of public education in the United States focusing on the development of structure and process in the educational enterprise.

EDTA 481 Qtr. Hrs. - 3 (3,0)
Trends and the Future of Education: Identification of trends and postulations concerning the future of education and formulation of criteria for appraisal of innovations in education.

EDTA 490 Qtr. Hrs. - 2 (2,0)
Senior Seminar: Education in Human Affairs: Provides an overview of basic objectives, strategies, and techniques in education. This course, primarily intended for the senior student, is offered as one of the advanced Environmental Studies Seminars. Not open to the student enrolled in the College of Education.

EDTA 601 Qtr. Hrs. - 3 (3,0)
Fundamental Research Procedures in Education: PR: Rank III Certificate or C.I. Design rationale and construction, sampling methods, control and limits.

EDTA 611 Qtr. Hrs. - 3 (3,0)
Social Factors in American Education: PR: Rank III Certificate or C.I. Analysis of general and specific aspects of American education as they relate to Social and Behavioral Sciences.

EDTA 612 Qtr. Hrs. - 3 (3,0)
Measurement and Evaluation in Education: PR: Rank III Certificate or C.I. Rationale and construction of evaluative instruments, parametric and non-parametric statistics, interpretation of data.

EDTA 613 Qtr. Hrs. - 3 (3,0)
Behavior Problems in the Public School: PR: Rank III Certificate or C.I. Role of the teacher in identification, strategies for remediation and referral procedures for working with behavioral problem children. Mental hygiene principles stressed.

EDTA 614 Qtr. Hrs. - 3 (3,0)
Studies in Human Development and Childhood: PR: Rank III Certificate or C.I. Recent research in Human Development and childhood relevant to contemporary American education. Emphasis prenatal through age 11.

EDTA 615 Qtr. Hrs. - 3 (3,0)
Studies in Teaching Analysis: PR: Rank III Certificate or C.I. Usage and analysis of micro-teaching, verbal and non-verbal approaches, social and behavioral variables influencing classroom learning.

EDTA 616 Qtr. Hrs. - 3 (3,0)
Techniques of Game Use in Education: PR: Rank III Certificate or C.I. Analysis, development, and use of educational games as an approach to classroom teaching.

EDTA 617 Qtr. Hrs. - 3 (3,0)
Adolescent Development and the Schools: PR: Rank III Certificate or C.I. Recent research in human development in adolescence with special emphasis upon research of interest to secondary school teachers.

EDTA 618 Qtr. Hrs. - 3 (3,0)
Instructional Models and Learning Theories in Education: PR: Rank III Certificate or C.I. Recent research and theoretical analysis of instruction-learning interfaces as they relate to learning in the schools.

EDUCATION — VISUAL ARTS

EDVA 401 Qtr. Hrs. - 3 (3,0)
Elementary School Art Instructional Analysis: PR: EDTA 206 and EDTA 307 or C.I. Methods and curriculum materials appropriate for teaching Visual Arts in the elementary schools.

EDVA 402 Qtr. Hrs. - 3 (3,0)
Secondary School Art Instructional Analysis: PR: EDTA 206 and EDTA 307 or C.I. Methods and curriculum materials for teaching Visual Arts in the secondary schools.

EDVA 431 Qtr. Hrs. - 5 (5,0)
Two-Dimensional Instructional Materials: PR: EDVA 401 or EDVA 402 or C.I. Application of two-dimensional materials to appropriate levels of instruction: chalk, ink, water color, crayon, tempera, acrylics, paper, fiber, and oils.

EDVA 432 Qtr. Hrs. - 5 (5,0)
Three-Dimensional Instructional Materials: PR: EDVA 401 or EDVA 402 or C.I. Application of three-dimensional materials to appropriate levels of instruction: wood, paper, plaster, stone, clay, wax, fiber, metal, and synthetics.

EDVA 433 Qtr. Hrs. - 5 (5,0)
Graphic Instructional Materials: PR: EDVA 401 or EDVA 402 or C.I. Application of graphic materials to appropriate level of instruction: direct and indirect basic processes of reproduction of mono and multi-printing.

EDVA 501 Qtr. Hrs. - 3 (3,0)
Contemporary Visual Arts Education: PR: EDVA 401 and EDVA 402 or C.I. A study of current programs and innovations in public school Visual Arts Programs.

EDVA 502 Qtr. Hrs. - 3 (3,0)
Found Arts: PR: EDVA 431 and EDVA 432 or C.I. Materials available for instruction in the public schools will be explored in depth in relation to their appropriateness and productive qualities.

EDVA 601 Qtr. Hrs. - 3 (3,0)
Two-Dimensional Instructional Materials: PR: EDVA 401, EDVA 402, and EDVA 431, or C.I. Application of two-dimensional materials to appropriate levels of instruction: chalk, ink, water color, crayon, tempera, acrylics, paper, fiber, and oils.

EDVA 602 Qtr. Hrs. - 3 (3,0)
Three-Dimensional Instructional Materials: PR: EDVA 401, EDVA 402, and EDVA 432, or C.I. Application of three-dimensional materials to appropriate levels of instruction: wood, paper, plaster, stone, clay, wax, fiber, metal, and synthetics.

EDVA 603 Qtr. Hrs. - 3 (3,0)
Graphic Instructional Materials: PR: EDVA 401, EDVA 402, and EDVA 433, or C.I. Application of graphic materials to appropriate level of instruction: direct and indirect basic processes of reproduction of mono and multi-printing.

VOCATIONAL / TECHNICAL EDUCATION

EDVE 381 Qtr. Hrs. - 3 (3,0)
Career Development Analysis: Analysis of job core areas. Community, state and federal informational services, educational requirements and employment prospects in selected areas. Application and job interview techniques.

EDVE 401 Qtr. Hrs. - 4 (4,0)
Philosophy and Principles of Technical Education: PR: Rank III Certificate or C.I. Overview of technical/vocational education; study of purposes, organization curriculum, financial supports, trends and history of technical/vocational education.

EDVE 402 Qtr. Hrs. - 5 (5,0)
Methods of Teaching Technical/Vocational Subjects: PR: Rank III Certificate or C.I. A study of the techniques, skills and procedures used in teaching technical/vocational education subjects.

EDVE 411 Qtr. Hrs. - 4 (4,0)
Analysis of Vocational Occupations: PR: Rank III Certificate or C.I. Techniques of analyzing components of an occupation to obtain content for instruction.

EDVE 421 Qtr. Hrs. - 4 (4,0)
Curriculum Planning for Vocational Education: PR: Rank III Certificate or C.I. Systematic development of a course of study for use in teaching a subject in an occupational area.

EDVE 422 Qtr. Hrs. - 4 (4,0)
Evaluation of Occupational Instruction: PR: Rank III Certificate or C.I. This course is concerned with the total evaluation process as it relates specifically to vocational instruction.

EDVE 423 Qtr. Hrs. - 4 (4,0)
Analysis of Learning as Applied to Vocational Education: PR: Rank III Certificate or C.I. Course is designed to familiarize the vocational application to the Vocational classroom.

EDVE 451 Qtr. Hrs. - 4 (4,0)
Occupational Education Facilities: PR: Rank III Certificate or C.I. Procedures and techniques in planning occupational educational facilities.

EDVE 461 Qtr. Hrs. - 4 (4,0)
Instructional Analysis in Industrial/Technical Education: PR: Rank III Certificate or C.I. Course objectives, techniques, materials, evaluation, and instructional media having special application for teaching occupational and technical subjects.

EDVE 462 Qtr. Hrs. - 4 (4,0)
Classroom Management in Occupational Education: PR: Rank III Certificate or C.I. Fundamentals of managing an occupational classroom or laboratory involving the concepts used in industrial plant management.

EDVE 463 Qtr. Hrs. - 4 (4,0)
Development of Occupational Education Programs: PR: Rank III Certificate or C.I. Occupational task analysis techniques and its application in formulating a basic instructional plan.

EDVE 481 Qtr. Hrs. - 4 (4,0)
Principles of Occupational Education: PR: Rank III Certificate or C.I. Recent developments, contemporary programs, and structure of vocational, technical, and adult education.

EDVE 482 Qtr. Hrs. 4 (4,0)
School/Community Development for Vocational Education: PR: Rank III Certificate or C.I. Identification, analyzation, and maintenance of working relationships between school and community institutions.

ELECTRICAL ENGINEERING AND COMMUNICATIONS SCIENCES

EECS 311 Qtr. Hrs. - 4 (3,3)
Introduction to Digital Circuits: PR: COMP 205. Electrical components used in digital switching circuits; properties of magnetic materials; construction of basic logic gates and flip-flops. Intended primarily for computer science majors.

EECS 321 Qtr. Hrs. - 4 (3,3)
Electrical Networks: PR: ENGR 321. Analysis of linear circuits. Laplace and Fourier transform techniques. State variable representation. Computer aided analysis techniques.

EECS 322 Qtr. Hrs. - 4 (3,3)
Electronic Engineering: PR: ENGR 322. Electronic devices and circuits including small signal amplifiers, power amplifiers, and switching circuits.

EECS 341 Qtr. Hrs. - 4 (4,0)
Electromagnetic Fields: PR: ENGR 322 and MATH 331. Introduction to electrical fields and waves.

EECS 411 Qtr. Hrs. - 4 (3,3)
Logical Component Design: PR: ENGR 322. Switching theory. Design and application of serial and parallel logical components including counters, registers, adders. Principles of stored program computers.

EECS 412 Qtr. Hrs. - 4 (3,3)
Logical Systems Design: PR: EECS 411. Systems investigation, design, and operation of digital computers; study of a basic hardware set and a basic software set.

EECS 413 Qtr. Hrs. - 4 (3,3)
Digital Systems and Circuits: PR: EECS 411. Investigation of integrated circuit digital subsystems and their incorporation into circuits for digital applications.

EECS 414 Qtr. Hrs. - 3 (2,2)
Analog Computers: PR: ENGR 321 and ENGR 342. Theory and operation of modern analog computer. Analysis and synthesis of continous and discrete systems by simulation.

EECS 431 ENGR 323 Qtr. Hrs. - 3 (2,3)
Electrical Machinery: PR: ~~EECS 331~~. Methods and techniques of systems analysis applied to the dynamics of electrical machinery.

EECS 442 Qtr. Hrs. - 4 (3,3)
Microwaves: PR: EECS 341. Microwave devices and systems and measurement techniques.

EECS 451 Qtr. Hrs. - 4 (3,3)
Communication Systems: PR: EECS 321 and EECS 322. Information transmission, modulation, and noise.

EECS 461 Qtr. Hrs. - 3 (2,3)
Semiconductor Devices: PR: EECS 322 and ENGR 352. Semiconductors with non-uniform impurity distribution; impurity diffusion, analysis of drift transitor with constant built-in field. Junction and metal-oxide field-effect transitors.

EECS 464 Qtr. Hrs. - 3 (2,3)
Active Circuits: PR: EECS 322. CR: ENGR 421. Integrated circuit fabrication and characteristics. Feedback amplifier types, performance and stability. Introduction to operational amplifier design and application.

EECS 513 Qtr. Hrs. - 3 (3,0)
Pulse Circuits: PR: Basic electronics course. Wave generating, shaping, and logic circuits.

EECS 514 Qtr. Hrs. - 1 (0,3)
Pulse Circuits Laboratory: Laboratory for EECS 513.

EECS 531 Qtr. Hrs. - 3 (3,0)
Environmental Control Systems: PR: ENGR 421 or equivalent. Modeling, control methods, stability, and optimization applied to environmental systems.

EECS 535 Qtr. Hrs. - 3 (3,0)
Electric Power Generation and Distribution: PR: ENGR 323 or equivalent. Introduction to electric energy sources. Concept of complex power in single and three phase systems. Synchronous machines, power transformer, and transmission lines.

EECS 543 Qtr. Hrs. - 3 (3,0)
Coherent Optics Applications: PR: PHYS 354. Theory and design of coherent optical systems lasers, information, processing, communication, holography.

EECS 551 Qtr. Hrs. - 3 (3,0)
Signal and System Analysis: Representation of signals and linear systems in the frequency and time domains, transforms, sampling, random signals.

EECS 553 Qtr. Hrs. - 3 (3,0)
Random Processes: PR: EECS 321 and ENGR 371. Random variables, averaging, sampling, elements of probability theory.

EECS 611 Qtr. Hrs. - 3 (3,0)
Modern Circuit Design: Application of computer aided methods for the analysis and synthesis of passive and active networks.

EECS 612 Qtr. Hrs. - 3 (3,0)
Synthesis of Electric Filters: Analysis and synthesis of electric filters.

EECS 613 Qtr. Hrs. - 3 (3,0)
Digital Circuits: Analysis of logic circuits, design of digital systems using contemporary integrated circuits, laboratory project.

EECS 621 Qtr. Hrs. - 3 (3,0)
Digital Computer Systems: PR: EECS 613. Investigation of general purpose computer systems and their components.

EECS 623 Qtr. Hrs. - 3 (3,0)
Modern Analog Computers: Analog programming fundamentals and techniques emphasizing integral use of logic and analog elements as applied to parameter optimization, boundary value problems, and partial differential equations.

EECS 624 Qtr. Hrs. - 1 (0,3)
Modern Analog Computer Laboratory: CR: EECS 623. Laboratory for EECS 623 consisting of simulation using a modern analog computer.

EECS 631 Qtr. Hrs. - 3 (3,0)
Modern Control Theory: State space method of analysis for discrete and continuous control, phase plane, Lyapunov stability.

EECS 632 Qtr. Hrs. - 3 (3,0)
Optimal Control Systems: PR: EECS 631. Cost Function, control restraints, initial and target states. Pontryagin's theorem, time, fuel, and energy optimization.

EECS 633 Qtr. Hrs. - 3 (3,0)
Nonlinear Control Systems: PR: EECS 631. Analysis and synthesis techniques for nonlinear systems, stability classifications, limit cycles, Popov's theorem. State variable description.

EECS 641 Qtr. Hrs. - 3 (3,0)
Electromagnetic Fields: Maxwell's equations. Boundary conditions. Propagation, reflection, and refraction of waves. Guided waves. Radiation.

EECS 643 Qtr. Hrs. - 3 (3,0)
Optical Electronic Communication Systems: PR: EECS 543 or C.I. Introduction to optical electronic systems such as both gas and solid state laser systems, optical detectors, modulators, and frequency convertors. Optical communication systems.

EECS 644 Qtr. Hrs. - 3 (3,0)
Optical Communication Theory: Application of information theory to optical communication systems. Development of optical correlation techniques. Holographic techniques and applications.

EECS 645 Qtr. Hrs. - 3 (3,0)
Remote Sensing Optical Systems: PR: EECS 341 or equivalent. Study of electromagnetic phenomena and systems at optical and near optical wavelengths and the use of such systems in environmental monitoring.

EECS 652 Qtr. Hrs. - 3 (3,0)
Digital Processing of Signals: Linear discrete system theory, z - transform theory, discrete spectrum analysis, and digital filtering.

EECS 653 Qtr. Hrs. - 3 (3,0)
Communication Theory: Theory of communicating in the presence of noise, modulation, optimum filtering, phase-lock loop.

EECS 662 Qtr. Hrs. - 3 (3,0)
Amplifier Design: Small-signal device models; analysis and synthesis of electronic amplifier circuits in frequency and time domains.

EECS 664 Qtr. Hrs. - 3 (3,0)
Operational Amplifiers: The differential amplifier stage, multi-staging, linear circuit applications, uses in non-linear circuits, active filters.

ENGINEERING CORE

ENGR 100 Qtr. Hrs. - 4 (4,0)
Oceanography and Space: Fundamentals of oceanography and space with emphasis on the engineering aspects and uses. May be used to satisfy Scientific Environment requirement of Environmental Studies Program.

ENGR 101 Qtr. Hrs. - 3 (2,2)
Engineering Graphics: Spatial visualization, sketching, and graphical presentation as a form of engineering communication. Engineering drawing, descriptive geometry, manipulation of vectors and graphical solution techniques.

ENGR 103 Qtr. Hrs. - 4 (3,2)
Creative Design: PR: C.I. Role of the engineer as a creative design professional. Emphasis on understanding the creative process and the factors that influence it. Case studies.

ENGR 104 Qtr. Hrs. - 3 (3,0)
Man Made World: Introduction to engineering and its role in the understanding of the man made world.

ENGR 151 Qtr. Hrs. - 3 (2,2)
Chemical Foundations of Engineering: PR: Satisfactory performance in one year of high school chemistry or physics; CR: MATH 211. Engineering applications of basic chemical concepts. Atomic and molecular structure, states of matter and their energies, chemical equilibria and reaction rates, organic compounds, and industrial processes.

ENGR 152 Qtr. Hrs. - 3 (2,2)
Chemical Foundations of Engineering: PR: ENGR 151. Continuation of ENGR 151.

ENGR 211 Qtr. Hrs. - 4 (4,0)
Engineering Concepts: CR: MATH 321. Introduction to the basic physical pheonomena essential to the understanding of engineering structures, machines processes, and systems. Primary emphasis on mechanics, materials behavior, and thermofluid mechanics phenomena.

ENGR 310 Qtr. Hrs. - 4 (4,0)
Engineering Analysis - Statics: PR: ENGR 211 and MATH 322. Fundamental concepts of mechanics including resultants of force systems, free-body diagrams, equilibrium of rigid bodies, and analyses of structures.

ENGR 311 Qtr. Hrs. - 4 (4,0)
Engineering Analysis – Dynamics: PR: ENGR 211 and MATH 323. Kinematics and kinetics of particles and rigid bodies; mass and acceleration, work and energy, and impulse and momentum.

ENGR 312 Qtr. Hrs. - 5 (4,2)
Mechanics of Materials: PR: ENGR 211; CR: MATH 331. Concepts of stress and strain, Hooke's Law; strength and deflection of axial force members, shafts in torsion and beams in flexure; combined stress; stability of columns.

ENGR 320 Qtr. Hrs. - 4 (4,0)
Electrical Science: PR: MATH 323 and ENGR 211. General concepts of electricity and magnetism; the development of fundamental laws of electrical engineering; the introduction of the basic circuit elements.

ENGR 321 Qtr. Hrs. - 4 (3,2)
Principles of Electrical Engineering: PR: ENGR 221; CR: MATH 331 and COMP 102. Introduction to fundamental laws of electrical circuits, including transient, steady-state AC, and general network analysis.

ENGR 322 Qtr. Hrs. - 4 (3,2)
Electronic Engineering: PR: ENGR 321. Electronic circuits.

ENGR 323 Qtr. Hrs. - 4 (3,2)
Electrical Devices and Systems: PR: ENGR 322. Electromagnetic energy conversion devices, feedback amplifiers, and instrumentation.

ENGR 331 Qtr. Hrs. - 3 (3,0)
Thermodynamics: PR: ENGR 311; CR: MATH 324. Work, heat and energy transformations. Relation of properties. Laws, concepts and modes of analysis common to all applications of thermodynamics in engineering.

ENGR 332 Qtr. Hrs. - 4 (3,2)
Fluid Mechanics: PR: ENGR 331. Basic principles of continium fluid mechanics and transport concepts.

ENGR 341 Qtr. Hrs. - 3 (3,0)
Engineering Economic Analysis: PR: ECON 201 or C.I. Economic evaluation of engineering alternatives. Time value of money and economic impact of taxes, risk, depreciation.

ENGR 342 Qtr. Hrs. - 3 (3,0)
Systems Analysis: PR: MATH 324; CR: MATH 331. Introduction to the mathematical analysis of linear systems. The behavior of linear systems as manifested by their characteristic functions. Introduction to Laplace transforms, matrices, and state variable techniques. System simulation by digital and analog computers.

EMCS 530 Qtr. Hrs. - 3 (3,0)
Engineering Data Reduction: PR: ENGR 371. Methods for processing and analysis of scientific test and process data, including computer filtering schemes and data compression and recovery techniques.

EMCS 572 Qtr. Hrs. - 3 (3,0)
Engineering Mathematical Analysis: EMCS 471 or C.I. The application of mathematical methods to engineering problems including linear analysis and transformations and matrix manipulation.

EMCS 573 Qtr. Hrs. - 3 (3,0)
Analytical Methods in Engineering: PR: EMCS 471 or C.I. The kinematics and dynamics of ideal field theory. Complex potential and conformal mapping with application to problems in fluid flow, thermal, and electrical potential.

EMCS 574 Qtr. Hrs. - 3 (3,0)
Analytical Methods in Engineering: PR: EMCS 471 or C.I. Applications and solutions of partial differential equations. Concepts of mathematical modeling. Development of characteristic properties of [illegible]

EMCS 575 3(3,0)
DISCRETE PROCESSES: PR: EMCS 572. Modeling and analysis of discrete systems. Difference equations, z-transformers, theory of discrete operators and transformations. Examples from engineering and the social and natural sciences.

EMCS 630 Qtr. Hrs. - 3 (3,0)
Discrete System Simulation: PR: ENGR 371 or equivalent. Computer-based modeling and analysis of discrete-space, discrete-time engineering related systems. Use of FORTRAN IV and GPSS/360 for implementing such models. Laboratory assignments.

EMCS 631 Qtr. Hrs. - 3 (3,0)
Continuous System Simulation: PR: ENGR 342 or equivalent. Computer-based modeling and analysis of continuous systems. Use of state-space techniques and the CSMP/360 simulation language. Laboratory assignments.

EMCS 632 Qtr. Hrs. - 3 (3,0)
Atomata Theory: PR: EECS 411 or equivalent. Structural theory and performance characteristics of finite-state machines.

EMCS 640 Qtr. Hrs. - 4 (3,2)
Engineering Data Reduction: PR: EMCS 530. Digital analysis of multidimensional data. Applications of multidimensional orthogonal transforms.

ENGINEERING MECHANICS AND MATERIALS SCIENCES

EMMS 351 Qtr. Hrs. - 4 (4,0)
Structural Mechanics: PR: ENGR 312. Analysis of statically indeterminate structures by flexibility and stiffness methods; energy methods. Analysis of columns. Plastic bending. Identical to CEES 351.

EMMS 355 Qtr. Hrs. - 3 (3,0)
Structural Steel Design: PR: ENGR 312. Design of steel structural members. Selected topics in beam design, column design, plastic design, connections and built-up members. Identical to CEES 355.

EMMS 357 Qtr. Hrs. - 3 (3,0)
Structural Concrete Design: PR: EMMS 355. Principles of designing reinforced concrete members. Selected topics in concrete mixes, beams, columns and ultimate analysis. Identical to CEES 357.

EMMS 411 Qtr. Hrs. - 3 (3,0)
Semiconductor Materials and Devices: PR: ENGR 323 and ENGR 352. Electrical conduction in semiconductors; basic concepts of drift, diffusion, carrier generation and recombination. Physical theory and models for the junction diode and transistor.

EMMS 412 Qtr. Hrs. - 3 (3,0)
Electronic Properties of Materials: PR: ENGR 351 and PHYS 344. Electronic processes in solids. Electrical, magnetic and optical properties of solids. Electron energies in solids. Superconducting materials.

EMMS 413 Qtr. Hrs. - 3 (3,0)
Thermodynamic Properties of Materials: PR: EMMS 433. Fundamental concepts of thermodynamics and kinetics are applied to the study of solid state phase transformations, equilibrium in multicomponent systems and diffusion in solids.

EMMS 414 Qtr. Hrs. - 3 (3,0)
Mechanical Properties of Materials: PR: ENGR 312 and ENGR 352. Fundamentals of mechanical behavior of engineering materials. Plastic deformation, creep, fatigue, relation of microstructure to macroscopic behavior.

EMMS 421 Qtr. Hrs. - 3 (3,0)
Theory of Crystalline Solids: PR: ENGR 352. Modern theory of crystalline materials. Topics treated include crystal structure, mechanical, thermal and transport properties.

EMMS 430 Qtr. Hrs. - 3 (3,0)
Structure and Properties of Alloys: PR: ENGR 352. Application of kinetic factors and phase equilibria to behavior of ferrous and non-ferrous alloys; relation of properties to structure, [illegible]

Qtr. Hrs. - 3 (3,0)
[illegible]nd EMMS 421. Principles [illegible]very and recrystallization, [illegible]ms.

EMMS 434 Qtr. Hrs. - 3 (2,2)
Experimental Techniques for Materials: PR: ENGR 352. Theoretical and experimental study of the application of optical microscopy, X-ray diffraction and electron microscopy for materials analysis.

EMMS 435 Qtr. Hrs. - 3 (3,0)
Structure and Properties of Ceramics and Polymers: PR: ENGR 352 or C.I. Structure of vitreous and crystalline non-metals; mechanical, thermal, and electrical properties of organic polymers and composite materials.

EMMS 441 Qtr. Hrs. - 4 (4,0)
Matrix Methods of Structural Analysis I: PR: EMMS 351 or C.I. Structural analysis of beams, frames, and plates by matrix methods. Same as CEES 451.

EMMS 455 Qtr. Hrs. - 3 (2,2)
Structural Steel Design: PR: ENGR 312. Design of steel structural members. Selected topics in beam design, column design, plastic design, connections and built-up members. Identical to CEES 455.

EMMS 457 Qtr. Hrs. - 3 (2,2)
Structural Concrete Design: PR: ENGR 312. Principles of designing reinforced concrete members. Selected topics in concrete mixes, beams, columns and ultimate analysis. Identical to CEES 457.

EMMS 501 Qtr. Hrs. - 3 (2,2)
Electron Microscopy of Crystalline Materials: PR: EMMS 421 or C.I. Introduction to the optics of the electron microscope, electron and electron diffraction contrast mechanisms in foils; evaluation of methods of specimen preparation.

EMMS 502 Qtr. Hrs. - 3 (2,2)
X-Ray Diffraction: PR: EMMS 421 or C.I. Properties of X-rays. Atomic arrangements in crystals and determination by X-ray diffraction. The Laue, rotating crystal, and powder methods. Applications to materials problems.

EMMS 508 Qtr. Hrs. - 3 (3,0)
Electronic Properties: PR: EMMS 412. Selected advanced topics on various aspects of electronic materials.

EMMS 511 Qtr. Hrs. - 3 (3,0)
Phase Transformation in Solids: PR: EMMS 413 and EMMS 430 or C.I. Principles of phase transformations, including precipitation, recrystallization, eutectoids, and martensite; emphasis on the understanding of the thermodynamic and kinetic processes underlying these phenomena.

EMMS 521 Qtr. Hrs. - 3 (3,0)
Corrosion: PR: EMMS 352 or C.I. Mechanisms, characteristics, types of corrosion. Evaluating corrosion resistance. Metals, ceramics, and organic materials in corrosive environments. Oxidation and other high temperature gas-metal reactions.

EMMS 541 Qtr. Hrs. - 4 (4,0)
Intermediate Mechanics of Materials: PR: ENGR 312 and MATH 331. Stress and strain at a point; failure theories; elements of plane elasticity; curved beams; bending and torsion of thin-walled structures; theory of thin plates.

ENGR 351 Qtr. Hrs. - 3 (3,0)
Structure and Properties of Materials I: PR: ENGR 152 and MATH 322. Electrons and bonding, crystals, noncrystalline solids, equilibrium diagrams, nonequilibrium phase transformations, and diffusion in solids.

ENGR 352 Qtr. Hrs. - 3 (2,2)
Structure and Properties of Materials II: PR: ENGR 351. Chemical, mechanical and electrical properties of materials; structure and properties of engineering alloys.

ENGR 361 Qtr. Hrs. - 3 (3,0)
Man and His Environment: PR: ENGR 152 or equivalent. Man's interaction with the air, water and land environment in which he lives. The role of engineering in control of the physical environment for the benefit of mankind.

ENGR 371 Qtr. Hrs. - 3 (3,0)
Probability and Statistics for Engineers: PR: MATH 323. Axioms of probability; combinatorial and geometrical probability; probability distributions; measures of location and dispersion; sampling and sampling distributions; estimation and tests of hypotheses; engineering applications. (Same as STAT 335.)

ENGR 380 Qtr. Hrs. - 3 (3,0)
Production Management Concepts: The evolution of concepts, processes and institutions in the management of the production function. Productivity trends and measures of performance in contemporary industrial production.

ENGR 403 Qtr. Hrs. - 3 (2,2)
Senior Creative Design: PR: Senior standing. Application of the fundamental engineering design algorithm to design synthesis and inventiveness methods culminating in an individual or group engineering design project.

ENGR 421 Qtr. Hrs. - 4 (4,0)
Linear Control Systems: PR: MATH 331 and ENGR 342. Theoretical and experimental study of the dynamics of linear, lumped parameter models of mechanical, electrical, fluid, thermal and mixed systems as applied to control systems.

ENGR 431 Qtr. Hrs. - 3 (3,0)
Thermodynamics and Transport Processes: PR: ENGR 331; CR: ENGR 332. Consequences of the second law and combined first and second law analysis of thermodynamic systems. Introduction to heat transfer including conduction, convection, and radiation.

ENGR 442 Qtr. Hrs. - 3 (3,0)
Operations Research: PR: ENGR 371. Mathematical methods of operations research; linear programming, techniques of optimizations.

ENGR 443 Qtr. Hrs. - 3 (3,0)
Engineering Administration: PR: ENGR 341 and senior standing. Engineering organization and administration; delegation of authority and responsibility; effective utilization of resources; compensation structure, labor-management relations; selected case studies.

ENGINEERING – INTERDISCIPLINARY COURSES

ENGR 480 Qtr. Hrs. - 3 (3,0)
Systems Modelling: PR: COMP 101 or equivalent. Representation of man/machine systems through analytic and computer-based models. Case studies in the analysis and improvement of systems in industry, education, and government.

ENGR 481 Qtr. Hrs. - 3 (3,0)
Man and Machine: The influence and interrelationship of invention and technical progress on the evolution of social forms and institutions.

ENGR 482 Qtr. Hrs. - 3 (3,0)
Engineering & Technology in History: Important developments in engineering and technology and their effect on society and our socio-economic processes and institutions.

ENGR 483 Qtr. Hrs. - 3 (3,0)
Technology and Social Change: Review of existing theories of social change, analysis of the role of technology as related to social change, and study of contemporary events in technology and their possible impact on society.

ENGR 484 Qtr. Hrs. - 3 (3,0)
Science in History: Examination of the reciprocal relations of science and society from ancient to recent times.

ENGR 485 Qtr. Hrs. - 3 (3,0)
Topics in Urban Development: Production, distribution, and consumption of various commodities and engineering relationships to distribution, internal structure, and function of urban developments. Interrelationship of engineering, social, economic, and cultural phenomena.

ENGR 486 Qtr. Hrs. - 3 (3,0)
Energy and Man: Investigations of the forms of energy available, energy resources versus requirements in a technological society of increasing population problems, solutions and future predictions.

ENGR 487 Qtr. Hrs. - 3 (3,0)
Historical Architecture: Architecture as the realization of changing aesthetic and cultural ideals and the expression of changing forms of society. Development of understanding of our physical environment through a study of the forms, functions and determinants of architecture.

ENGR 488 Qtr. Hrs. - 3 (3,0)
Man and Environment: PR: C.I. A discussion of environmental factors of importance to man, man's interaction with the environment, engineering and non-engineering measures to insure improvement and maintenance of environmental quality. Not intended for engineering students.

ENGR 489 Qtr. Hrs. - 3 (3,0)
Computers, Cybernetics and Society: The effects of computers and the cybernetic revolution on the individual and society. Effects of positive and negative feedback on biological, technological, and social systems. Computers and their interactions with human system.

ENGR 490 Qtr. Hrs. - 2 (2,0)
Engineering in Human Affairs: The impact of engineering on modern society. This course, primarily intended for the senior student, is offered as one of the Advanced Environmental Studies Seminars. Not open to students majoring in the College of Engineering.

ENGINEERING MATHEMATICS AND COMPUTER SYSTEMS

EMCS 423 Qtr. Hrs. - 3 (3,0)
Mathematics Review for Engineers: Comprehensive review of college algebra, trigonometry, analytical geometry, vector calculus, and an introduction to differential equations for non-current engineering students wishing to pursue advanced work.

EMCS 430 Qtr. Hrs. - 3 (3,0)
Engineering Software Design: PR: COMP 102 or equivalent; CR: MATH 331. Design theory and construction of special purpose engineering software. Survey of problem oriented programming languages.

EMCS 431 Qtr. Hrs. - 3 (3,0)
Mini-Computers in Engineering: PR: COMP 102. Orientation in the NOVA mini-computer. Organization of the computer, memory and processor, basic programming, input-output equipment and instructions, and computer interfacing.

EMCS 432 Qtr. Hrs. - 3 (3,0)
Principles of Computer Control: PR: ENGR 421 and EMCS 431 or C.I. Design, analysis, and implementation of computer based control systems, including analog, digital and on-line schemes for process identification and control.

EMCS 433 Qtr. Hrs. - 3 (3,0)
Computer Systems in Engineering: PR: EMCS 431 and EMCS 432. Techniques of direct digital optimizing and adaptive control applied to a fully instrumented laboratory scale physical process.

EMCS 460 Qtr. Hrs. - 3 (3,0)
Optimum Seeking Methods: PR: C.I. Methods of search for the optimum of incompletely specified functions. Single and multivariable search techniques, random search, Febonacci search, minimax concept, and gradient methods.

EMCS 470 Qtr. Hrs. - 3 (3,0)
Engineering Mathematical Systems: PR: MATH 331 and IEMS 447. The solution of differential equations generated from modeling real systems. Examples from economics, biology, engineering, et al.

EMCS 471 Qtr. Hrs. - 3 (3,0)
Engineering Mathematical Analysis: PR: MATH 324 and MATH 331. The application of mathematical methods to engineering problems including vector and tensor fields, state space techniques, orthogonal curvilinear coordinates and orthogonal functions.

EMCS 530 Qtr. Hrs. - 3 (3,0)
Engineering Data Reduction: PR: ENGR 371. Methods for processing and analysis of scientific test and process data, including computer filtering schemes and data compression and recovery techniques.

EMCS 572 Qtr. Hrs. - 3 (3,0)
Engineering Mathematical Analysis: EMCS 471 or C.I. The application of mathematical methods to engineering problems including linear analysis and transformations and matrix manipulation.

EMCS 573 Qtr. Hrs. - 3 (3,0)
Analytical Methods in Engineering: PR: EMCS 471 or C.I. The kinematics and dynamics of ideal field theory. Complex potential and conformal mapping with application to problems in fluid flow, thermal, and electrical potential.

EMCS 574 Qtr. Hrs. - 3 (3,0)
Analytical Methods in Engineering: PR: EMCS 471 or C.I. Applications and solutions of partial differential equations. Concepts of mathematical modeling. Development of characteristic properties of equations and solution methods.

EMCS 575

EMCS 610 Qtr. Hrs. - 4 (3,2)
Hybrid Computer Systems: PR: EMCS 471 or C.I. Analysis of Hybrid Systems and components. Applications of hybrid systems to problems in optimization theory, control, man-machine systems, and biological systems.

EMCS 630 Qtr. Hrs. - 3 (3,0)
Discrete System Simulation: PR: ENGR 371 or equivalent. Computer-based modeling and analysis of discrete-space, discrete-time engineering related systems. Use of FORTRAN IV and GPSS/360 for implementing such models. Laboratory assignments.

EMCS 631 Qtr. Hrs. - 3 (3,0)
Continuous System Simulation: PR: ENGR 342 or equivalent. Computer-based modeling and analysis of continuous systems. Use of state-space techniques and the CSMP/360 simulation language. Laboratory assignments.

EMCS 632 Qtr. Hrs. - 3 (3,0)
Atomata Theory: PR: EECS 411 or equivalent. Structural theory and performance characteristics of finite-state machines.

EMCS 640 Qtr. Hrs. - 4 (3,2)
Engineering Data Reduction: PR: EMCS 530. Digital analysis of multidimensional data. Applications of multidimensional orthogonal transforms.

ENGINEERING MECHANICS AND MATERIALS SCIENCES

EMMS 351 Qtr. Hrs. - 4 (4,0)
Structural Mechanics: PR: ENGR 312. Analysis of statically indeterminate structures by flexibility and stiffness methods; energy methods. Analysis of columns. Plastic bending. Identical to CEES 351.

~~EMMS 355 Qtr. Hrs. - 3 (3,0)~~
~~Structural Steel Design: PR: ENGR 312. Design of steel structural members. Selected topics in beam design, column design, plastic design, connections and built-up members. Identical to CEES 355.~~

~~EMMS 357 Qtr. Hrs. - 3 (3,0)~~
~~Structural Concrete Design: PR: EMMS 355. Principles of designing reinforced concrete members. Selected topics in concrete mixes, beams, columns and ultimate analysis. Identical to CEES 357.~~

EMMS 411 Qtr. Hrs. - 3 (3,0)
Semiconductor Materials and Devices: PR: ENGR 323 and ENGR 352. Electrical conduction in semiconductors; basic concepts of drift, diffusion, carrier generation and recombination. Physical theory and models for the junction diode and transistor.

EMMS 412 Qtr. Hrs. - 3 (3,0)
Electronic Properties of Materials: PR: ENGR 351 and PHYS 344. Electronic processes in solids. Electrical, magnetic and optical properties of solids. Electron energies in solids. Superconducting materials.

EMMS 413 Qtr. Hrs. - 3 (3,0)
Thermodynamic Properties of Materials: PR: EMMS 433. Fundamental concepts of thermodynamics and kinetics are applied to the study of solid state phase transformations, equilibrium in multicomponent systems and diffusion in solids.

EMMS 414 Qtr. Hrs. - 3 (3,0)
Mechanical Properties of Materials: PR: ENGR 312 and ENGR 352. Fundamentals of mechanical behavior of engineering materials. Plastic deformation, creep, fatigue, relation of microstructure to macroscopic behavior.

EMMS 421 Qtr. Hrs. - 3 (3,0)
Theory of Crystalline Solids: PR: ENGR 352. Modern theory of crystalline materials. Topics treated include crystal structure, mechanical, thermal and transport properties.

EMMS 430 Qtr. Hrs. - 3 (3,0)
Structure and Properties of Alloys: PR: ENGR 352. Application of kinetic factors and phase equilibria to behavior of ferrous and non-ferrous alloys; relation of properties to structure, composition, and environmental factors.

EMMS 433 Qtr. Hrs. - 3 (3,0)
Physical Metallurgy: PR: ENGR 331 and EMMS 421. Principles underlying the study of diffusion, recovery and recrystallization, and solidification processes in metal systems.

EMMS 434 Qtr. Hrs. - 3 (2,2)
Experimental Techniques for Materials: PR: ENGR 352. Theoretical and experimental study of the application of optical microscopy, X-ray diffraction and electron microscopy for materials analysis.

EMMS 435 Qtr. Hrs. - 3 (3,0)
Structure and Properties of Ceramics and Polymers: PR: ENGR 352 or C.I. Structure of vitreous and crystalline non-metals; mechanical, thermal, and electrical properties of organic polymers and composite materials.

EMMS 441 Qtr. Hrs. - 4 (4,0)
Matrix Methods of Structural Analysis I: PR: EMMS 351 or C.I. Structural analysis of beams, frames, and plates by matrix methods. Same as CEES 451.

EMMS 455 Qtr. Hrs. - 3 (2,2)
Structural Steel Design: PR: ENGR 312. Design of steel structural members. Selected topics in beam design, column design, plastic design, connections and built-up members. Identical to CEES 455.

EMMS 457 Qtr. Hrs. - 3 (2,2)
Structural Concrete Design: PR: ENGR 312. Principles of designing reinforced concrete members. Selected topics in concrete mixes, beams, columns and ultimate analysis. Identical to CEES 457.

EMMS 501 Qtr. Hrs. - 3 (2,2)
Electron Microscopy of Crystalline Materials: PR: EMMS 421 or C.I. Introduction to the optics of the electron microscope, electron and electron diffraction contrast mechanisms in foils; evaluation of methods of specimen preparation.

EMMS 502 Qtr. Hrs. - 3 (2,2)
X-Ray Diffraction: PR: EMMS 421 or C.I. Properties of X-rays. Atomic arrangements in crystals and determination by X-ray diffraction. The Laue, rotating crystal, and powder methods. Applications to materials problems.

EMMS 508 Qtr. Hrs. - 3 (3,0)
Electronic Properties: PR: EMMS 412. Selected advanced topics on various aspects of electronic materials.

EMMS 511 Qtr. Hrs. - 3 (3,0)
Phase Transformation in Solids: PR: EMMS 413 and EMMS 430 or C.I. Principles of phase transformations, including precipitation, recrystallization, eutectoids, and martensite; emphasis on the understanding of the thermodynamic and kinetic processes underlying these phenomena.

EMMS 521 Qtr. Hrs. - 3 (3,0)
Corrosion: PR: EMMS 352 or C.I. Mechanisms, characteristics, types of corrosion. Evaluating corrosion resistance. Metals, ceramics, and organic materials in corrosive environments. Oxidation and other high temperature gas-metal reactions.

EMMS 541 Qtr. Hrs. - 4 (4,0)
Intermediate Mechanics of Materials: PR: ENGR 312 and MATH 331. Stress and strain at a point; failure theories; elements of plane elasticity; curved beams; bending and torsion of thin-walled structures; theory of thin plates.

ENG 306 Qtr. Hrs. - 3 (3,0)
Writing for Children: Practice in writing publishable literature for pre-school and elementary level children.

ENG 307 Qtr. Hrs. - 3 (3,0)
Writing Skills: Intensive practice in description, narration, exposition and argumentation; control of tone, mood, viewpoint, and level of diction. Applicable to article, essay, and short-story writing.

ENG 308 Qtr. Hrs. - 3 (3,0)
Magazine Writing I: PR: ENG 307 or C.I. Structure and organization of articles, essays, profiles, and reviews; market analysis; data gathering.

ENG 309 Qtr. Hrs. - 3 (3,0)
Magazine Writing II: PR: ENG 308. Continuation of ENG 308.

ENG 310 Qtr. Hrs. - 3 (3,0)
Professional Report Writing II: Instruction and practice in scientific writing including preparation of scientific reports in the student's particular field.

ENG 311 Qtr. Hrs. - 3 (3,0)
Survey of American Literature, 1588-1865

ENG 312 Qtr. Hrs. - 3 (3,0)
Survey of American Literature, 1865-1914

ENG 313 Qtr. Hrs. - 3 (3,0)
Survey of American Literature Since 1914

ENG 314
Survey of British

ENG 316 3(3,0)
CONTINENTAL EUROPEAN FICTION SINCE 1900: A selection of significant works of fiction written in various languages during the present century, read in translation.

ENG 316

ENG 317
World Literature ancient Hebrew, Renaissance Europe.

ENG 318 Qtr. Hrs. - 4 (4,0)
World Literature II: Readings from Moliere, Voltaire, Goethe, Pushkin, Balzac, Tolstoy, Ibsen, Mann, Kafka, Camus, and others. Open to students who have not taken World Literature I.

ENG 320 Qtr. Hrs. - 4 (4,0)
Women in Literature: An investigation of attitudes toward women in literature. Selections from Shakespeare, Eliot, Flaubert, Ibsen, Freud, Lawrence, Hemingway, Albee, Freidan, Millett, Greer, and Steinem.

ENG 321 Qtr. Hrs. - 3 (3,0)
Exploring Poetry: A broad, cultural approach to poetry, with emphasis upon the major themes and preoccupations of poets of all ages. Students from all disciplines are welcome.

ENG 361 Qtr. Hrs. - 3 (3,0)
Practical Criticism: Student evaluation of selected fiction, poetry, and drama through practical exercises in literary criticism.

ENG 371 Qtr. Hrs. - 3 (3,0)
Principles of Linguistics: An overview of the modern linguist's approach to language. Analytic methods of phonology, morphology, syntax. Brief systematic survey of dialectology, language acquisition and semantics.

ENG 400 Qtr. Hrs. - 3 (3,0)
Writing About Literature: Supplies background for recognizing literary allusions and technical terms, assures acquaintance with professional literary journals, and provides supervision of student critical writing.

ENG 401 Qtr. Hrs. - 3 (3,0)
Writing Practicum I: PR: C.I. Intensive writing practice in fiction, non-fiction, or verse.

ENG 402 Qtr. Hrs. - 3 (3,0)
Writing Practicum II: PR: ENG 401. Continuation of ENG 401.

ENG 403 Qtr. Hrs. - 3 (3,0)
Writing Practicum III: PR: ENG 402. Continuation of ENG 402.

ENG 404 Qtr. Hrs. - 3 (3,0)
Writing Fiction I: PR: Evidence of writing skill satisfactory to the instructor. Analysis of significant fiction; market research; intensive writing practice leading to a completed body of fiction writing suitable for publication.

ENG 405 Qtr. Hrs. - 3 (3,0)
Writing Fiction II: PR: ENG 404. Continuation of ENG 404.

ENG 410 Qtr. Hrs. - 3 (3,0)
Ethnic Literature in America: Contributions of linguistic and ethnic groups of non-English origin to the literature of the United States.

ENG 415 Qtr. Hrs. - 3 (3,0)
Readings in Shakespeare: Reading and analysis of a selected group of comedies, histories, and tragedies for English Education majors.

ENG 430 Qtr. Hrs. - 3 (3,0)
Chaucer: *The Canterbury Tales, Troilus and Criseyde,* and other works.

ENG 434 Qtr. Hrs. - 3 (3,0)
Milton: *Paradise Lost, Paradise Regained, Samson Agonistes,* shorter poems and selected prose.

ENG 444 Qtr. Hrs. - 3 (3,0)
The British Novel in the 18th Century

ENG 445 Qtr. Hrs. - 3 (3,0)
The British Novel in the 19th Century

ENG 446 Qtr. Hrs. - 3 (3,0)
The American Novel in the 19th Century

ENG 451 Qtr. Hrs. - 3 (3,0)
British and American Fiction Since 1900

ENG 452 Qtr. Hrs. - 3 (3,0)
British and American Poetry Since 1900

critics from classical antiquity through the modern era.

ENG 471 Qtr. Hrs. - 3 (3,0)
Modern English Grammar: Methods in the study of modern English grammar. Emphasis upon the analysis and comparison of traditional, structural, and transformational grammar.

ENG 473 Qtr. Hrs. - 3 (3,0)
Transformational Grammar: PR: ENG 471. Introduction to philosophical basis of transformational grammar. Students will develop grammar for modern English.

ENG 483 Qtr. Hrs. - 3 (3,0)
Black English: A study of the phonology, morphology, and syntax of Black English. Provides an understanding of the implications of Black English in contemporary society.

ENG 501 Qtr. Hrs. - 4 (4,0)
Linguistics: Modern linguistic theories and studies focusing on language acquisition and development, contemporary American English, semantics, and paralinguistics.

ENG 508 Qtr. Hrs. - 4 (4,0)
Rhetoric and Literature: Investigates the development of written strategies of persuasion. Traces their relation to practical and imaginative literature. Applications to classroom teaching of literature and composition.

ENG 520 Qtr. Hrs. - 4 (4,0)
Studies in Contemporary Fiction: Fiction of the last 20 years in the United States and Britain.

ENG 521 Qtr. Hrs. - 4 (4,0)
English Renaissance Literature I: Elizabethan poetry and prose, 1588-1603.

ENG 522 Qtr. Hrs. - 4 (4,0)
English Renaissance Literature II: Jacobean and Caroline poetry and prose, 1603-1642.

ENG 523 Qtr. Hrs. - 4 (4,0)
English Renaissance Literature III: Commonwealth poetry and prose, 1642-1660, including Milton.

ENG 524 Qtr. Hrs. - 4 (4,0)
Studies in Restoration English Literature: Literature of the Restoration.

ENG 525 Qtr. Hrs. - 4 (4,0)
English Literature, 1700-1745: Prose and poetry of the first half of the 18th. Century.

EMMS 600 Qtr. Hrs. - 3 (3,0)
Physical Metallurgy: PR: EMMS 433 or C.I. Thermodynamics and kinetics of nucleation and growth reactions in metallurgical processes with special emphasis on nucleation in solids. Diffusion theory. Point, line and surface defects.

EMMS 601 Qtr. Hrs. - 3 (3,0)
Physical Metallurgy: PR: EMMS 600. Continuation of EMMS 600.

EMMS 603 Qtr. Hrs. - 3 (2,2)
Electron Microscopy II: PR: EMMS 501. Kinematical and dynamical theory of contrast in thin crystalline films. Selected advanced topics in electron microscopy applied to materials.

EMMS 610 Qtr. Hrs. - 3 (3,0)
Mechanical Metallurgy: PR: EMMS 414. Theoretical treatment of solid solution hardening, strain hardening, precipitation hardening. Microscopic treatment of theories of fatigue, fracture, creep. The role of dislocation interactions.

EMMS 611 Qtr. Hrs. - 3 (3,0)
Mechanical Metallurgy: PR: EMMS 610. Continuation of EMMS 610.

EMMS 620 Qtr. Hrs. - 3 (3,0)
Physical Ceramics: PR: EMMS 435 or C.I. Composition and structure of ceramics and glasses. Discussion of thermal conductivity, heat capacity, magnetic behavior and ferroelectric behavior with emphasis on real materials.

EMMS 630 Qtr. Hrs. - 3 (3,0)
Polymer Science: PR: EMMS 435 or C.I. Consideration of the structure and properties of polymers from the viewpoint of materials science. Specific attention to polymerization processes, crystal structure, and mechanical properties.

EMMS 641 Qtr. Hrs. - 4 (4,0)
Theory of Elasticity: PR: EMMS 541 and EMCS 573. Tensor analysis. Stress and strain at a point. Linear elastic behavior in two and three dimensions. Energy methods. Various methods of solution for plane problems.

EMMS 642 Qtr. Hrs. - 4 (4,0)
Continuum Mechanics: PR: EMMS 312 or C.I. Tensor analysis. Lagrangian and Eulerian descriptions of deformation. Constitutive equations. Behavior of elastic solids. Body moments and couple stresses.

EMMS 643 Qtr. Hrs. - 4 (4,0)
Continuum Mechanics: PR: EMMS 642. Continuation of EMMS 642.

EMMS 644 Qtr. Hrs. - 3 (3,0)
Micromechanics of Composite Materials: PR: EMMS 641 or C.I. Anisotropic elasticity. Elastic inclusions. Elastic behavior of piecewise homogeneous materials. Bounds on elastic constants. Laminated, anisotropic plates. Failure theories.

EMMS 645 Qtr. Hrs. - 3 (3,0)
Theory of Plasticity: PR: EMMS 641 or C.I. The ideal rigid-plastic solid. Collapse. Upper and lower bound theorems. Linear structures. Yield criteria. Characteristics. Plates.

EMMS 646 Qtr. Hrs. - 3 (3,0)
Elastic Stability: PR: EMMS 641 or C.I. Theoretical treatment of stability of structural elements. Columns. Frameworks. Thin-walled beams. Methods of Ritz, Galerkin, and Vianello-stodola.

EMMS 652 Qtr. Hrs. - 4 (4,0)
Theory of Plates and Shells: PR: EMMS 541 or C.I. Theory of bending of thin plates. Variational principles. Non-linear theory of plates. Theory of thin shells with small deformations. Various approximate theories. Stability.

EMMS 654 Qtr. Hrs. - 3 (3,0)
Dynamics of Structures: PR: EMMS 661 or C.I. Dynamic behavior of linear structures. Natural vibrations of structural systems. Damping in structures. Response to periodic and non-periodic excitations. Emphasis on matrix methods.

EMMS 661 Qtr. Hrs. - 3 (3,0)
Advanced Dynamics: ENGR 311, EMCS 471 or C.I. Dynamics of particles, distributed mass systems, and rigid bodies from an advanced viewpoint. Virtual work principle, Lagrange's and Euler's equations of motion and Hamilton's principle.

EMMS 662 Qtr. Hrs. - 3 (3,0)
Advanced Dynamics: PR: EMMS 661. Continuation of EMMS 661.

ENGINEERING TECHNOLOGY

ENT 303 Qtr. Hrs. - 4 (4,0)
Problem Analysis: PR: MATH 311, MATH 312 or C.I. Applications of computational techniques to selected problems in the practice of engineering technology. Problems relating to specific option areas.

ENT 304 Qtr. Hrs. - 3 (3,0)
Technical Economic Analysis: PR: Junior standing. Analysis of cost elements in technical projects. Basis for comparison of alternatives. Economic analysis of technical operations.

ENT 305 Qtr. Hrs. - 4 (4,0)
Applied Mechanics: PR: MATH 110 and MATH 111 or equivalent. Static and dynamic effects of forces acting on rigid bodies. Friction, centers of gravity, moments of inertia, rotation, plane motion.

ENT 306 Qtr. Hrs. - 4 (4,0)
Materials and Processes: PR: MATH 110 and MATH 111 or equivalent. Relation between structure and properties of metals, wood, ceramics and polymers. Testing and inspection, casting, forming and working of metals, heat treatment, and joining.

ENT 321 Qtr. Hrs. - 5 (4,3)
Electronic Circuits: PR: MATH 311 and basic electrical circuit theory. Introduction to graphical and analytical analysis of electronic circuits. Amplifiers, feedback networks and power supplies.

ENT 322 Qtr. Hrs. - 4 (3,3)
Digital Circuits: Operation and application of digital circuits. Laboratory.

ENT 331 Qtr. Hrs. - 3 (3,0)
Hydraulics and Hydrology: PR: Junior standing. Applied hydraulics and hydrology including topics in closed and open channel flow, rainfall, runoff, seepage, ground water, storage and impoundments, wells, etc.

ENT 332 Qtr. Hrs. - 3 (3,0)
Water Supply Systems: Fundamental techniques applicable to technical projects dealing with water resources, hydrology, water treatment, transmission and distribution.

ENT 333 Qtr. Hrs. - 3 (3,0)
Wastewater Systems: Fundamental techniques applicable to technical projects dealing with collection and transmission of wastewater, treatment of wastewater, handling and disposal of effluent and sludge.

ENT 341 Qtr. Hrs. - 3 (3,0)
Contracts and Specifications: Study of basic legal principles involved in contractual provisions and interrelationships with applicable specifications and the application of such principles.

ENT 342 Qtr. Hrs. - 4 (3,2)
Electro-Mechanical Design: PR: ENT 305, and ENT 401. Masses, motions, kinematics and dynamics of machinery.

ENT 343 Qtr. Hrs. - 4 (3,3)
Product Design: PR: ENT 342. Principles of layout and dimensioning for production. Consideration of design factors, standards, specifications and codes with emphasis on producibility.

ENT 351 Qtr. Hrs. - 3 (3,0)
Work Analysis: PR: Junior standing. Analysis of work elements in technical projects. Work simplification and methods improvements in technical operations.

ENT 352 Qtr. Hrs. - 3 (3,0)
Cost Estimation and Analysis: Determination and analysis of cost of manufacturing and construction operations including applicable indirect costs. Costs of all applicable work materials and services are included.

ENT 353 Qtr. Hrs. - 3 (3,0)
Computer Methods in Industry: PR: COMP 102. An overview of industrial EDP applications. Includes data processing concepts, functions of the computer, and applications in data processing, process and machine control.

ENT 401 Qtr. Hrs. - 5 (4,2)
Electricity and Electronics: Electricity and magnetism, applications of the basic principles of electric circuits, electronic amplifiers.

ENT 402 Qtr. Hrs. - 5 (4,2)
Strength of Materials: PR: ENT 305 or C.I. Relationship between external forces and action of members of a strcture. Topics include stress and strain, torsion, beams, columns, stress concentrations and fatigue.

ENT 403 Qtr. Hrs. - 4 (4,0)
Applied Thermodynamics: PR: ENT 305. Introduction to the concepts of energy, work, and heat; thermodynamic properties and processes; basic laws and formulae; cycle efficiency; flow through orifices and nozzles; empirical design formulae.

ENT 421 Qtr. Hrs. - 3 (3,0)
Computer Systems: PR: COMP 102 and ENT 322. The hardware organization of process control and special purpose digital computers. Peripherals and programming techniques.

ENT 422 Qtr. Hrs. - 3 (3,0)
Antennas and Propagation: Study of the basic theory and technology used in high frequency transmission lines and waveguides, propagation and radiation, antennas.

ENT 423 Qtr. Hrs. - 3 (3,0)
Feedback Control: Feedback control system analysis and design techniques, control system components, and applications to practical control systems.

ENT 424 Qtr. Hrs. - 3 (3,0)
Communications Systems: The principles of oscillators, noise, symmetrical circuits, modulation and demodulation, pulse and ramp circuits.

ENT 431 Qtr. Hrs. - 3 (3,0)
Treatment Plant Analyses and Control: Basic techniques applicable to lab analyses, control measures, and overall operation of water and wastewater treatment plants.

ENT 432 Qtr. Hrs. - 3 (3,0)
Environmental Sampling and Analyses: Fundamental techniques applicable to sampling and performing lab analyses of our physical environment, including air, water and land. Interrelation and analysis of results.

ENT 433 Qtr. Hrs. - 3 (3,0)
Air Pollution Control: Fundamental techniques applicable to analyzing composition and sources of pollutants, measuring concentrations, and controlling emissions. Air pollution control programs, laws, rules, and regulations.

ENT 434 Qtr. Hrs. - 3 (3,0)
Solid Waste Management: Fundamental techniques applicable to technical projects involving solid waste composition, collection and disposal. Solid wastes programs, laws, rules, and regulations.

ENT 441 Qtr. Hrs. - 4 (3,2)
Structural Design: ,PR: ENT 342 and ENT 402. Design of mechanical and structural elements. Strength, fatigue, safety factors and code requirements.

ENT 442 Qtr. Hrs. - 3 (3,0)
Design Integration: PR: ENT 343. Project design involving planning, control, prototype construction, testing and evaluation.

ENT 443 Qtr. Hrs. - 3 (3,0)
Senior Project: PR: ENT 442. Individual project involving product conception, design, development, construction, and testing. A final technical report is required of each student.

ENT 451 Qtr. Hrs. - 3 (3,0)
Process Planning and Scheduling: Planning and control of specific tasks, and manhours related thereto. Includes description and application of techniques used in construction and manufacturing industries.

ENT 452 Qtr. Hrs. - 3 (3,0)
Occupational Safety: Accident prevention and the operation of an industrial safety program. Basic requirements of the Occupational Safety and Health Act standards.

ENT 453 Qtr. Hrs. - 3 (3,0)
Industrial Quality Control: Basic concepts and practices in industrial quality control. Technical specifications, measurement standards, inspection, and gaging. Process control techniques.

ENT 454 Qtr. Hrs. - 3 (3,0)
Plant Maintenance Operation: Organization of the maintenance function in manufacturing and service industries. Maintenance planning and scheduling analysis of required and preventive maintenance operations, including economic trade-offs.

ENGLISH

ENG 100 Qtr. Hrs. - 1 (1,0)
Vocabulary Study: A word skills course for students wishing to improve their vocabulary.

ENG 101 Qtr. Hrs. - 4 (4,0)
Composition I: Expository writing with emphasis on effective communication. Grammar and mechanics will not form a major part of this course; if the student is deficient, he will achieve proficiency through independent study. Writing topics to be based on selected readings.

ENG 103 Qtr. Hrs. - 3 (3,0)
Current Literature: PR: ENG 101 or equivalent. Writing practice based on readings in contemporary prose and poetry selected to invite the interest of students in literature.

Note on Freshman English Program:
ENG 101 and 103 may be taken to satisfy the State Department requirement for certification in secondary school teaching or for transfer to colleges that require one full year of Freshman English. Students who intend to major in English, English Education, or Library Science must take ENG 103. English Education and Library Science majors must complete ENG 201 before enrolling in any English courses numbered above 201 with the exception of ENG 301.

ENG 201 Qtr. Hrs. - 4 (4,0)
Literature of Modern Man: Reading and discussion of types and forms of modern literature. Satisfies section B of the cultural and historical foundation in the Environmental Studies Program.

ENG 202 Qtr. Hrs. - 3 (3,0)
Literary Analysis: Analysis of fiction, drama, and verse in terms of major elements: plot, conflict, characterization, viewpoint, rhetorical and poetic devices, figurative language, meter, rhyme, verse forms.

ENG 208 Qtr. Hrs. - 3 (3,0)
Principles of Creative Writing: For freshman and sophomore students. An exploratory course in the several types of creative writing; group analysis of original writing; critical reading of established authors. May be repeated for credit.

ENG 209 Qtr. Hrs. - 3 (3,0)
Introduction to Verse Writing: Practice in writing poetry; group analysis and criticism of work produced by individual students.

ENG 210 Qtr. Hrs. - 3 (3,0)
Introduction to Fiction Writing: Practice in writing the short story; group analysis and criticism of work produced by individual students.

ENG 211 Qtr. Hrs. - 3 (3,0)
Survey of English Literature to 1625

ENG 212 Qtr. Hrs. - 3 (3,0)
Survey of English Literature, 1626-1798

ENG 213 Qtr. Hrs. - 3 (3,0)
Survey of English Literature, 1798-1914

ENG 301 Qtr. Hrs. - 3 (3,0)
Professional Report Writing I: Emphasis on clear expository writing of memoranda, reports and articles in the student's particular field.

ENG 302 Qtr. Hrs. - 3 (3,0)
Creative Writing Workshop I: PR: C.I. Practice in established forms: essay, short story, and poetry.

ENG 303 Qtr. Hrs. - 3 (3,0)
Creative Writing Workshop II: PR: ENG 302 or C.I. Individualized practice in writing in one of the established forms; analytic study of the work of pertinent authors.

ENG 304 Qtr. Hrs. - 3 (3,0)
Creative Writing Workshop III: PR: ENG 303 or C.I. Individualized practice in writing in one of the established forms; analytic study of the work of pertinent authors.

ENG 305 Qtr. Hrs. - 3 (3,0)
Structure of Verse: Intensive study of the structural characteristics of English poetry, metrical systems, rhyme, scansion, and poetic rhetorical devices.

ENG 306 Qtr. Hrs. - 3 (3,0)
Writing for Children: Practice in writing publishable literature for pre-school and elementary level children.

ENG 307 Qtr. Hrs. - 3 (3,0)
Writing Skills: Intensive practice in description, narration, exposition and argumentation; control of tone, mood, viewpoint, and level of diction. Applicable to article, essay, and short-story writing.

ENG 308 Qtr. Hrs. - 3 (3,0)
Magazine Writing I: PR: ENG 307 or C.I. Structure and organization of articles, essays, profiles, and reviews; market analysis; data gathering.

ENG 309 Qtr. Hrs. - 3 (3,0)
Magazine Writing II: PR: ENG 308. Continuation of ENG 308.

ENG 310 Qtr. Hrs. - 3 (3,0)
Professional Report Writing II: Instruction and practice in scientific writing including preparation of scientific reports in the student's particular field.

ENG 311 Qtr. Hrs. - 3 (3,0)
Survey of American Literature, 1588-1865

ENG 312 Qtr. Hrs. - 3 (3,0)
Survey of American Literature, 1865-1914

ENG 313 Qtr. Hrs. - 3 (3,0)
Survey of American Literature Since 1914

ENG 314 Qtr. Hrs. - 3 (3,0)
Survey of British Literature Since 1914

ENG 316

ENG 317 Qtr. Hrs. - 4 (4,0)
World Literature I: Poetry, prose, and drama selected from ancient Hebrew, Greek, and Oriental literature and from that of Renaissance Europe.

ENG 318 Qtr. Hrs. - 4 (4,0)
World Literature II: Readings from Moliere, Voltaire, Goethe, Pushkin, Balzac, Tolstoy, Ibsen, Mann, Kafka, Camus, and others. Open to students who have not taken World Literature I.

ENG 320 Qtr. Hrs. - 4 (4,0)
Women in Literature: An investigation of attitudes toward women in literature. Selections from Shakespeare, Eliot, Flaubert, Ibsen, Freud, Lawrence, Hemingway, Albee, Freidan, Millett, Greer, and Steinem.

ENG 321 Qtr. Hrs. - 3 (3,0)
Exploring Poetry: A broad, cultural approach to poetry, with emphasis upon the major themes and preoccupations of poets of all ages. Students from all disciplines are welcome.

ENG 361 Qtr. Hrs. - 3 (3,0)
Practical Criticism: Student evaluation of selected fiction, poetry, and drama through practical exercises in literary criticism.

ENG 371 Qtr. Hrs. - 3 (3,0)
Principles of Linguistics: An overview of the modern linguist's approach to language. Analytic methods of phonology, morphology, syntax. Brief systematic survey of dialectology, language acquisition and semantics.

ENG 400 Qtr. Hrs. - 3 (3,0)
Writing About Literature: Supplies background for recognizing literary allusions and technical terms, assures acquaintance with professional literary journals, and provides supervision of student critical writing.

ENG 401 Qtr. Hrs. - 3 (3,0)
Writing Practicum I: PR: C.I. Intensive writing practice in fiction, non-fiction, or verse.

ENG 402 Qtr. Hrs. - 3 (3,0)
Writing Practicum II: PR: ENG 401. Continuation of ENG 401.

ENG 403 Qtr. Hrs. - 3 (3,0)
Writing Practicum III: PR: ENG 402. Continuation of ENG 402.

ENG 404 Qtr. Hrs. - 3 (3,0)
Writing Fiction I: PR: Evidence of writing skill satisfactory to the instructor. Analysis of significant fiction; market research; intensive writing practice leading to a completed body of fiction writing suitable for publication.

ENG 405 Qtr. Hrs. - 3 (3,0)
Writing Fiction II: PR: ENG 404. Continuation of ENG 404.

ENG 410 Qtr. Hrs. - 3 (3,0)
Ethnic Literature in America: Contributions of linguistic and ethnic groups of non-English origin to the literature of the United States.

ENG 415 Qtr. Hrs. - 3 (3,0)
Readings in Shakespeare: Reading and analysis of a selected group of comedies, histories, and tragedies for English Education majors.

ENG 430 Qtr. Hrs. - 3 (3,0)
Chaucer: *The Canterbury Tales, Troilus and Criseyde,* and other works.

ENG 434 Qtr. Hrs. - 3 (3,0)
Milton: *Paradise Lost, Paradise Regained, Samson Agonistes,* shorter poems and selected prose.

ENG 444 Qtr. Hrs. - 3 (3,0)
The British Novel in the 18th Century

ENG 445 Qtr. Hrs. - 3 (3,0)
The British Novel in the 19th Century

ENG 446 Qtr. Hrs. - 3 (3,0)
The American Novel in the 19th Century

ENG 451 Qtr. Hrs. - 3 (3,0)
British and American Fiction Since 1900

ENG 452 Qtr. Hrs. - 3 (3,0)
British and American Poetry Since 1900

ENG 453 Qtr. Hrs. - 3 (3,0)
British and American Drama Since 1900

ENG 460 Qtr. Hrs. - 3 (3,0)
Historical Survey of Literary Criticism: Study of the major critics from classical antiquity through the modern era.

ENG 471 Qtr. Hrs. - 3 (3,0)
Modern English Grammar: Methods in the study of modern English grammar. Emphasis upon the analysis and comparison of traditional, structural, and transformational grammar.

ENG 473 Qtr. Hrs. - 3 (3,0)
Transformational Grammar: PR: ENG 471. Introduction to philosophical basis of transformational grammar. Students will develop grammar for modern English.

ENG 483 Qtr. Hrs. - 3 (3,0)
Black English: A study of the phonology, morphology, and syntax of Black English. Provides an understanding of the implications of Black English in contemporary society.

ENG 501 Qtr. Hrs. - 4 (4,0)
Linguistics: Modern linguistic theories and studies focusing on language acquisition and development, contemporary American English, semantics, and paralinguistics.

ENG 508 Qtr. Hrs. - 4 (4,0)
Rhetoric and Literature: Investigates the development of written strategies of persuasion. Traces their relation to practical and imaginative literature. Applications to classroom teaching of literature and composition.

ENG 520 Qtr. Hrs. - 4 (4,0)
Studies in Contemporary Fiction: Fiction of the last 20 years in the United States and Britain.

ENG 521 Qtr. Hrs. - 4 (4,0)
English Renaissance Literature I: Elizabethan poetry and prose, 1588-1603.

ENG 522 Qtr. Hrs. - 4 (4,0)
English Renaissance Literature II: Jacobean and Caroline poetry and prose, 1603-1642.

ENG 523 Qtr. Hrs. - 4 (4,0)
English Renaissance Literature III: Commonwealth poetry and prose, 1642-1660, including Milton.

ENG 524 Qtr. Hrs. - 4 (4,0)
Studies in Restoration English Literature: Literature of the Restoration.

ENG 525 Qtr. Hrs. - 4 (4,0)
English Literature, 1700-1745: Prose and poetry of the first half of the 18th. Century.

ENG 526 Qtr. Hrs. - 4 (4,0)
English Literature, 1745-1798: Prose and poetry of the last half of the 18th. Century.

ENG 527 Qtr. Hrs. - 4 (4,0)
The Romantic Revolt (19th. Century Literature): The romantic revolt in poetry and prose: English, American, and Continental literature, 1798-1832.

ENG 528 Qtr. Hrs. - 4 (4,0)
Doubt and Belief (19th. Century Literature): English, American, and Continental literature, 1832-1870.

ENG 529 Qtr. Hrs. - 4 (4,0)
Decadence and Renewal (19th. Century Literature): English, American, and Continental literature, 1870-1914.

ENG 531 Qtr. Hrs. - 4 (4,0)
Shakespeare's Comedies

ENG 532 Qtr. Hrs. - 4 (4,0)
Shakespeare's Histories

ENG 533 Qtr. Hrs. - 4 (4,0)
Shakespeare's Tragedies

ENG 541 Qtr. Hrs. - 4 (4,0)
English Drama to 1642 (exclusive of Shakespeare)

ENG 542 Qtr. Hrs. - 4 (4,0)
Restoration and 18th. Century English Drama

ENG 561 Qtr. Hrs. - 4 (4,0)
Use and Enjoyment: Criticism from Plato to Johnson.

ENG 562 Qtr. Hrs. - 4 (4,0)
Modern Theories of Literature: Criticism since 1800.

ENG 572 Qtr. Hrs. - 4 (4,0)
History of the English Language: Study of the English language and its development from Anglo-Saxon to Modern.

ENG 610 Qtr. Hrs. - 4 (4,0)
Literary Genres: Provenance, structure and critical problems in a specific genre such as tragedy, the epic, the novel, or the lyric.

ENG 620 Qtr. Hrs. - 4 (4,0)
World Literature: The study of the influence on British and American literature of selected foreign works read in translation.

ENG 630 Qtr. Hrs. - 4 (4,0)
Movements in Literature: Study of a movement such as neturalism, romanticism, or classicism, or a pervasive idea such as the absurd.

ENG 640 Qtr. Hrs. - 4 (4,0)
Problems in Linguistics: PR: ENG 501. In-depth study of the application of linguistics to various aspects of teaching and communication.

ENG 650 Qtr. Hrs. - 4 (4,0)
Major Literary Authors: Study of a single author or of two or three associated literary authors, with emphasis on biography, bibliography, and style.

ENG 660 Qtr. Hrs. - 4 (4,0)
Media and Popular Literature: Study of the literary content of contemporary media; popular fictions, such as science fiction, detective fiction, and historical fiction. Application to classroom teaching.

ENG 680 Qtr. Hrs. - 4 (4,0)
Practicum: The Teaching of Literature: Close work with an experienced instructor in teaching an undergraduate literature course, combined with regular group meetings for discussion of problems of teaching literature.

ENG 685 Qtr. Hrs. - 4 (4,0)
Practicum: The Teaching of Composition: Close work with an experienced instructor in teaching an undergraduate composition course, combined with regular group meetings for discussion of problems of teaching composition.

ENVIRONMENTAL STUDIES
PHYSICAL EDUCATION

The Environmental Studies Physical Education Program is designed to enhance the physical and mental development of the student. A student may receive three quarter hours credit toward graduation by enrolling and satisfactorily completing any one of the following courses:

ESPE 301 Qtr. Hrs. - 3 (2,2)
Aquatics: A study and application of the physiological benefits of basic aquatic developmental skills — elementary and advanced strokes, water safety, springboard diving, and interval training.

ESPE 302 Qtr. Hrs. - 3 (2,2)
Body Development (M)

ESPE ~~303~~ 302 M+ Qtr. Hrs. - 3 (2,2)
Body Development (W): A study and application of the metabolic, neuromuscular, and cardiovascular changes resulting from select physical activities.

ESPE 304 Qtr. Hrs. - 3 (2,2)
Golf: A study of performance and application in basic and advanced skills, rules, and etiquette. Physiological and social values accruing from this carry-over activity.

ESPE 305 Qtr. Hrs. - 3 (2,2)
Tennis: A study of performance and application in basic and advanced skills, rules, and etiquette. Physiological and social values accruing from this carry-over activity.

ESPE 306 Qtr. Hrs. - 3 (2,2)
Life Saving: Instruction, training and certification in basic life saving swimming skills.

ESPE 307 Qtr. Hrs. - 3 (2,2)
Scuba Diving: Instruction, training and certification in basic diving skills with self-contained underwater breathing apparatus. Students may be required to supply their own equipment.

ESPE 308 Qtr. Hrs. - 3 (2,2)
Interpretive Dance: Instruction and analysis of creative dance performance as an art form.

ESPE 483 Qtr. Hrs. - 3 (3,0)
Actualization of Physical Potential in Contemporary Living: Factors underlying physical potential. Self physical assessment, values of physical activity, self-improvement, contemporary problems, body awareness, body mechanics, family responsibilities. Development of individual program.

F

FINANCE

FIN 301 Qtr. Hrs. - 5 (5,0)
Finance: PR: ACCY 212 or ACCY 307, ECON 202 and ECON 203. Fundamentals of obtaining and administering funds to meet short-term and long-term capital requirements.

FIN 311 Qtr. Hrs. - 4 (4,0)
Risk and Insurance: PR: Junior Standing or C.I. Principles and methods of risk reduction and specialization, with particular emphasis on insurance.

FIN 321 Qtr. Hrs. - 4 (4,0)
Investments: PR: FIN 301 or C.I. Principles of determining investment policy for individual and institutional portfolios.

FIN 331 Qtr. Hrs. - 4 (4,0)
Money and Banking: PR: ECON 203 or C.I. The nature of money, the functioning of the commercial banking system and its relation to the level of economic activity, and the activities of the Federal Reserve System and Treasury.

FIN 341 Qtr. Hrs. - 4 (4,0)
Real Estate: PR: Junior standing. Basic principles of real estate ownership, its use and transfer, brokerage, management, legislation, and importance to the economy.

FIN 411 Qtr. Hrs. - 4 (4,0)
Financial Institutions: PR: FIN 301. The operation of financial institutions and an analysis of their role in the economy.

FIN 421 Qtr. Hrs. - 4 (4,0)
Security Analysis: PR: FIN 301 and FIN 321. The problems of selecting securities for various investment purposes.

FIN 431 Qtr. Hrs. - 4 (4,0)
Financial Management: PR: FIN 301. Analytical techniques for dealing with financial problems and their application to corporate financial management.

FIN 501 Hrs. - 4 (4,0)
Financial Concepts: PR: Acceptance into the MBA Program. Effects of financial decisions upon the firm, interrelationships of these effects, and alternatives available to financial managers in meeting financing needs of the firm.

FIN 601 Qtr. Hrs. - 3 (3,0)
Capital Management and Analysis: PR: Graduate standing and FIN 501 or equivalent. Financial planning, valuation, sources of long-term capital, concepts of cost of capital and capital budgeting.

FIN 611 Qtr. Hrs. - 3 (3,0)
Financial Management of Current Operations: PR: Graduate standing and FIN 501 or equivalent. Management of current assets and current liabilities. Special problems associated with expansion, contraction, merger and failure.

FIN 631 Qtr. Hrs. - 3 (3,0)
Analysis of Investment Opportunities: PR: Graduate standing and FIN 501 or equivalent. Techniques for evaluating securities, investment decision making, and portfolio management.

FOREIGN LANGUAGES

FL 323 Qtr. Hrs. - 4 (4,0)
Comparative World Literature I: Masterworks of world literature in translation from the Book of Job to Cervantes. Authors represented include Homer, Sophocles, Cicero, Virgil, St. Augustine, Dante, Chaucer, Montaigne, and Shakespeare.

FL 324 Qtr. Hrs. - 4 (4,0)
Comparative World Literature II: Continuation of FL 323, from the Renaissance to the 20th Century, including works by Pascal, Milton, Rousseau, Goethe, Wordsworth, Poe, Balzac, Chekov, Baudelaire, Yeats, Mann, and Camus. Need not be taken in sequence with FL 323.

FRENCH

FRE 101 Qtr. Hrs. - 4 (4,1)
Elementary French Language and Civilization: Designed to initiate the student to the major language skills; listening, speaking, reading, and writing, in addition to an introduction to French culture.

FRE 102 Qtr. Hrs. - 4 (4,1)
Elementary French Language and Civilization: PR: FRE 101 or equivalent. Continuation of FRE 101.

FRE 103 Qtr. Hrs. - 4 (4,1)
Elementary French Language and Civilization: PR: FRE 102 or equivalent. Continuation of FRE 102.

FRE 201 Qtr. Hrs. - 4 (4,1)
Intermediate French Language and Civilization: PR: FRE 103 or equivalent. Designed to continue development of language skills at the intermediate level, together with a review of grammar, study of syntax, idiomatic expressions, extensive readings and further study of French culture.

FRE 202 Qtr. Hrs. - 4 (4,1)
Intermediate French Language and Civilization: PR: FRE 201 or equivalent. Continuation of FRE 201.

FRE 203 Qtr. Hrs. - 4 (4,1)
Intermediate French Language and Civilization: PR: FRE 202 or equivalent. Continuation of FRE 202 with greater emphasis on French civilization from the Middle Ages to the present.

FRE 301 Qtr. Hrs. - 4 (4,0)
French Conversation: PR: FRE 203 or equivalent. Development of skills in conversation and comprehension. This course may be repeated for credit. When repeated, credit will apply to general electives only.

FRE 303 Qtr. Hrs. - 4 (4,0)
French Composition: PR: FRE 203 or equivalent. Development of skills in composition. This course may be repeated for credit. When repeated, credit will apply to general electives only.

FRE 311 Qtr. Hrs. - 4 (4,0)
Survey of French Literature: PR: FRE 203 or equivalent. Main literary currents and works from the Middle Ages through the Renaissance.

FRE 312 Qtr. Hrs. - 4 (4,0)
Survey of French Literature: PR: FRE 203 or equivalent. Main literary currents and works of the seventeenth and eighteenth centuries.

FRE 313 Qtr. Hrs. - 4 (4,0)
Survey of French Literature: PR: FRE 203 or equivalent. Main literary currents and works of the nineteenth and twentieth centuries.

FRE 321 Qtr. Hrs. - 4 (4,0)
Short Stories of 18th, 19th and 20th Centuries: PR: FRE 203 or equivalent. Selected readings designed to increase reading speed and develop analytical abilities. Authors include: Voltaire, Maupassant, Flaubert, Camus and others.

FRE 401 Qtr. Hrs. - 4 (4,0)
French Phonetics and Diction: PR: FRE 303 or equivalent. French phonology with emphasis on phonic groupings.

FRE 402 Qtr. Hrs. 4 (4,0)
Advanced French Conversation: PR: FRE 301. Advanced conversation on directed topics from various disciplines: Literature, art, psychology, philosophy, music, business and the sciences.

FRE 403 Qtr. Hrs. - 4 (4,0)
Advanced French Composition: PR: FRE 303. Readings and written imitations of modern literary styles in the form of themes, sketches, poems and original stories.

FRE 422 Qtr. Hrs. - 4 (4,0)
Seventeenth Century French Theater: PR: FRE 312. Corneille, Racine, and Moliere. A study of the lives and principal works of the authors.

FRE 431 Qtr. Hrs. - 4 (4,0)
French Literature of the Eighteenth Century: PR: FRE 312. The philosophical movement: Montesquieu, Vauvenargues, Voltaire, Diderot, Buffon.

FRE 441 Qtr. Hrs. - 3 (3,0)
Romantic Poetry and Drama: PR: FRE 312. Great poets and dramatists of the Romantic Movement: Hugo, Lamartine, Vigny, Musset and others.

FRE 442 Qtr. Hrs. - 3 (3,0)
The Romantic Novel: PR: FRE 312. A study of several novels of the early nineteenth century which characterizes the Romantic movement.

FRE 443 Qtr. Hrs. - 4 (4,0)
Nineteenth Century French Literature: PR: FRE 313. Realism and naturalism.

FRE 444 Qtr. Hrs. - 4 (4,0)
Nineteenth Century French Literature: PR: FRE 313. Parnassianism and symbolism.

FRE 451 Qtr. Hrs. - 4 (4,0)
Twentieth Century French Literature: Contemporary French drama and poetry.

FRE 453 Qtr. Hrs. - 4 (4,0)
Twentieth Century French Literature: PR: FRE 313. Contemporary French novel.

FRE 481 Qtr. Hrs. - 4 (4,0)
Stylistics: PR: FRE 301 or equivalent. An intense study of textual criticism. An examination of the relationship between language and literature; explications and linguistic analysis of literary texts.

G

GEOGRAPHY, PHYSICAL

GEOG

~~GEO~~ 100 Qtr. Hrs. - 4 (4,0)
Physical Geography: Basic physical elements of geography including climate, landforms, soils, natural vegetation, minerals and their integrated patterns of world distribution.

GEOG

~~GEO~~ 301 Qtr. Hrs. - 3 (3,0)
Resources Geography: Analysis of basic principles and problems associated with development, use, conservation, and management of natural resources with special emphasis on the United States.

GEOGRAPHY, SOCIAL

GEOG 350 Qtr. Hrs. - 4 (4,0)
Urban Geography: The city as a geographical phenomenon created by human effort, its historical development; patterns of land use as related to economic, sociological and political influences.

GEOG 360 Qtr. Hrs. - 4 (4,0)
World Political Geography: Analysis of the types and distributions of political systems, review of factors which affect relative power of diverse politics, areas of conflict and arbitration.

GEOLOGY

GEOL 100 Qtr. Hrs. - 4 (4,0)
Introductory Geology: Survey of geology including current topics such as earthquakes, drifting continents, and lunar history. Appropriate for the Environmental Studies Program.

GEOL 201 Qtr. Hrs. - 4 (2,4)
Physical Geology: PR: GEOL 100. Geologic principles and recent theories developed in some depth with the aid of rock and mineral samples and geologic maps.

GEOL 202 Qtr. Hrs. - 4 (2,4)
Historical Geology: PR: GEOL 201. Evolution of continents and of life as reconstructed from geologic evidence and fossil remains. North America emphasized, but other continents considered.

GERMAN

GER 101 Qtr. Hrs. - 4 (4,1)
Elementary German Language and Civilization: Designed to initiate the student to the major language skills; listening, speaking, reading, and writing, in addition to an introduction to German culture.

GER 102 Qtr. Hrs. - 4 (4,1)
Elementary German Language and Civilization: PR: GER 101 or equivalent. Continuation of GER 101.

GER 103 Qtr. Hrs. - 4 (4,1)
Elementary German Language and Civilization: PR: GER 102 or equivalent. Continuation of GER 102.

GER 201 Qtr. Hrs. - 4 (4,1)
Intermediate German Language and Civilization: PR: GER 103 or equivalent. Designed to continue development of language skills at the intermediate level, together with a review of grammar, study of syntax, idiomatic expressions, extensive reading, and further study of German culture.

GER 202 Qtr. Hrs. - 4 (4,1)
Intermediate German Language and Civilization: PR: GER 201 or equivalent. Continuation of GER 201.

GER 203 Qtr. Hrs. - 4 (4,1)
Intermediate German Language and Civilization: PR: GER 202 or equivalent. Continuation of GER 202 with greater emphasis on German civilization from the Middle Ages to the present.

GER 301 Qtr. Hrs. - 4 (4,0)
German Conversation: PR: GER 203 or equivalent. Development of skills in conversation and comprehension through practice. This course may be repeated for credit. When repeated, credit will apply to general electives only.

GER 303 Qtr. Hrs. - 4 (4,0)
German Composition: PR: GER 203 or equivalent. Development of skills in composition. This course may be repeated for credit. When repeated, credit will apply to general electives only.

GER 3111 Qtr. Hrs. - 4 (4,0)
Survey of German Literature I: PR: GER 203 or equivalent. Main literary currents and works from the Middle Ages through the Renaissance and Baroque.

GER 312 Qtr. Hrs. - 4 (4,0)
Survey of German Literature II: PR: GER 203 or equivalent. Main literary currents and works of the 17th and 18th centuries.

GER 313 Qtr. Hrs. - 4 (4,0)
Survey of German Literature III: PR: GER 203 or equivalent. Main literary currents and works of the 19th and 20th centuries.

GER 321 Qtr. Hrs. - 4 (4,0)
Short Story: PR: GER 203 or equivalent. German short prose works of the 19th and 20th centuries.

HISTORY

HIST 201 Qtr. Hrs. - 4 (4,0)
Western Culture and Civilization I: Rise of culture and civilization in the West from earliest times to the eve of the Renaissance.

HIST 202 Qtr. Hrs. - 4 (4,0)
Western Culture and Civilization II: Continuation of HIST 201. Europe from its feudal-manorial state through the Napoleonic era.

HIST 203 Qtr. Hrs. - 4 (4,0)
Western Culture and Civilization III: Continuation of HIST 202. The Romantic era, the influence of liberalism, nationalism, and modern industrialism upon political, social, economic, and intellectual life.

HIST 210 Qtr. Hrs. - 4 (4,0)
Introduction to Anglo-American Law: An historical survey of the development of the principles and processes of the American law from its origins in English common law to the present. (Same as LES 201.)

HIST 301 Qtr. Hrs. - 4 (4,0)
European Social and Intellectual History: 1650 - 1800: Science and political absolutism; the Enlightenment and the *philosophes:* secularism, cosmopolitanism and humanitarianism; the French Revolution; religious revival, and the beginning of romanticism.

HIST 302 Qtr. Hrs. - 4 (4,0)
European Social and Intellectual History: 1800 - 1917: Napoleon and nationalism; the new ideologies: conservation, liberalism, romanticism, republicanism and socialism; urbanization, technology and mass culture; Social Darwinism and religious decline; *Realpolitik*, racism, imperialism and militarism.

HIST 304 Qtr. Hrs. - 4 (4,0)
Survey of East Asia: An introduction to Far Eastern cultures including India since the Age of the Moguls, China since early European penetration, Japan since the Hermit Kingdom.

HIST 311 Qtr. Hrs. - 4 (4,0)
American Economic History: An introduction to the economic development of the United States with emphasis upon agriculture, labor, industrialization, transportation, and banking.

HIST 312 Qtr. Hrs. - 4 (4,0)
American Political History: An introduction to political life in the United States with emphasis upon the three branches of government, political parties, and the federal system.

HIST 313 Qtr. Hrs. - 4 (4,0)
American Social History: An introduction to the effect of social change on Americans and their political institutions. Emphasis is placed on demographic, sexual and technological change.

HIST 320 Qtr. Hrs - 4 (4,0)
The Changing Frontier in American History: A survey of the types and geographic settings of the frontiers. Attention given to the impact of the frontier on American History.

HIST 322 Qtr. Hrs. - 4 (4,0)
U.S. Constitutional History to 1865: Development of the constitutional system and the idea of Constitutionalism from the colonial emphasis on written contracts and natural law through "nullification" and Civil War.

HIST 323 Qtr. Hrs. - 4 (4,0)
U.S. Constitutional History Since 1865: Post-war constitutional changes; the curious role of the 14th amendment; expansion of national power over the economy and civil rights; increasing popular belief in "Constitutionalism."

HIST 324 Qtr. Hrs. - 4 (4,0)
Black American History: The history of the Negro in Africa and in the United States. Emphasis is placed on the effects of an African heritage, slavery, and post-Civil War conditions on Black Americans. In addition, contemporary issues relating to Black Americans are analyzed.

HIST 326 Qtr. Hrs. - 4 (4,0)
History of Florida to 1860

HIST 327 Qtr. Hrs. - 4
History of Florida 1860 - Present

HIST 328 Qtr. Hrs. - 4 (4,0)
History of the South to 1865: Development of the southern colonies, beginning of sectionalism, the cotton economy, slavery, Calhoun's constitutional theories, secession, Civil War and its aftermath.

HIST 329 Qtr. Hrs. - 4 (4,0)
History of the South Since 1865: Reconstruction, the "solid South" and the racial dilemma, progressivism for whites only, southern literature, 20th century economic, political, and social changes, and the new Reconstruction.

HIST 330 Qtr. Hrs. - 4 (4,0)
Latin American History: The Colonial Period: A survey course in Latin American History to the beginning of the Wars of Independence in 1810.

HIST 331 Qtr. Hrs. - 4 (4,0)
Latin American History: The 19th Century: Continuation of HIST 330.

HIST 332 Qtr. Hrs. - 4 (4,0)
Latin American History: The 20th Century: Continuation of HIST 331.

HIST 353 Qtr. Hrs. - 4 (4,0)
Early Middle Ages: A survey of social, economic, political, religious, and cultural developments in Europe from the fall of Rome to the 10th century.

HIST 354 Qtr. Hrs. - 4 (4,0)
Late Middle Ages: A survey of social, economic, political, religious, and cultural developments in Europe from the 10th to the 13th centuries.

HIST 355 Qtr. Hrs. - 4 (4,0)
Renaissance and Reformation: The influence of Renaissance humanism on arts, letters, and politics; Luther and Protestantism; the Catholic Counter-Reformation and the Thirty Years' War.

HIST 411 Qtr. Hrs. - 4 (4,0)
United States History: to 1763: The voyages of discovery, the origins of the thirteen colonies, and their political, economic, social, and religious life in the 17th and 18th centuries.

HIST 412 Qtr. Hrs. - 4 (4,0)
United States History: 1763-1789: The American Revolution — its origins, course, and impact upon American society — the Articles of Confederation, the Philadelphia Convention and its work.

HIST 413 Qtr. Hrs. - 4 (4,0)
United States History: 1789-1824: The writing of the Constitution, the Federalist decade, Jeffersonian Democracy, the War of 1812, and emergence of New Nationalism.

HIST 414 Qtr. Hrs. - 4 (4,0)
United States History: 1820-1860: Administration of Andrew Jackson to the Civil War.

HIST 415 Qtr. Hrs. - 4 (4,0)
United States History: 1860-1876: Civil War, Reconstruction, and impact of industrialism.

HIST 416 Qtr. Hrs - 4 (4,0)
United States History: 1876-1918: The Agrarian Revolt, the Spanish-American War, and the Progressive Era.

HIST 417 Qtr. Hrs. - 4 (4,0)
United States History: 1914-1940: The Progressive Reforms of Woodrow Wilson, World War I, post-war prosperity, the Depression, and the New Deal.

HIST 418 Qtr. Hrs. - 4 (4,0)
United States History: 1941-Present: Contemporary America from World War II.

HIST 420 Qtr. Hrs. - 4 (4,0)
United States Diplomatic History: 1776-1914: The evolution of American foreign policy with stress upon the international background and the constitutional and political problems in planning policy.

HIST 421 Qtr. Hrs. - 4 (4,0)
United States Diplomatic History: 1914-Present: Continuation of HIST 420.

HIST 422 Qtr. Hrs. - 4 (4,0)
Social and Intellectual History of the United States to 1865: The European Backgrounds; Puritanism; Enlightenment;

the Great Awakening; Revolutionary Thought; Romanticism; the Southern Mind and the Yankee Response; Popular Culture and the rise of recreation.

HIST 423 Qtr. Hrs. - 4 (4,0)
Social and Intellectual History of the United States Since 1865: The Darwinian Revolution and its ramifications; revolt of the intellectuals; the media explosion; mass entertainment in mass culture; the loss of community, the nuclear age, and presentism.

HIST 424 Qtr. Hrs. - 4 (4,0)
European Diplomatic History: 1815-1914: The relationship of the European great powers from the Congress of Vienna to the outbreak of the First World War.

HIST 425 Qtr. Hrs. - 4 (4,0)
European Diplomatic History: 1914-Present: The relationship of the European great powers from the outbreak of the First World War to the present.

HIST 435 Qtr. Hrs. - 4 (4,0)
China in 19th and 20th Centuries: The Mongols in China; coming of the Europeans; social structure; Communist movement; Japanese aggression.

HIST 439 Qtr. Hrs. - 4 (4,0)
Modern Japan, 19th and 20th Centuries: A survey of the Tokugawa Shogunate; Western contact in the 19th century; World War I; Japanese militarism; World War II; and U.S. occupation.

HIST 441 Qtr. Hrs. - 4 (4,0)
The Rise of Modern Germany: Central Europe from the Reformation to 1890: The Thirty Years' War and absolute despotism; Austro-Prussian rivalry; the German Enlightenment, Bismarck and the Second Reich.

HIST 442 Qtr. Hrs. - 4 (4,0)
Hitler's Third Reich: German nationalism and militarism; World War I and the Versailles Treaty; the Weimar Republic and the rise of the Nazis; Second World War, division and recovery.

HIST 445 Qtr. Hrs. - 4 (4,0)
The Rise of Mass Culture and Democracy, 1890-1930: Europe in the era of modern technology, militarism, the First World War, Paris Peace Conference, popular culture, and new democratic institutions east of the Rhine.

HIST 446 Qtr. Hrs. - 4 (4,0)
Fascism and the Totalitarian Dictatorships: Totalitarian ideologies, institutions, and practices in Lenin's and Stalin's Russia, Mussolini's Italy, and Hitler's Third Reich; fascist movements in the non-totalitarian states.

HIST 447 Qtr. Hrs. - 4 (4,0)
The Second World War and the Rebirth of Europe: Origins of World War II; Hitler's "New Order," resistance movements; Cold War; de-Stalinization in Russia; Sovietization of East Central Europe; reconstruction, prosperity in the West.

HIST 457 Qtr. Hrs. - 4 (4,0)
French Revolution and the French Imperium, 1789-1815: Causes and course of the revolution; the rise and fall of Napoleon; impact on the thought and action of Western Europe.

HIST 458 Qtr. Hrs. - 4 (4,0)
France, 1815-1914: Legacy of the French Revolution; Revolutions of 1830 and 1848; Franco-Prussian War and Third French Republic; Franco-German Rivalry and formation of the Entente.

HIST 459 Qtr. Hrs. - 4 (4,0)
France, 1914-Present: World War and aftermath; Locarno spirit; rise of Fascism and French response, World War II; Fourth Republic and Reconstruction; deGaulle and the Fifth Republic.

HIST 461 Qtr. Hrs. - 4 (4,0)
English History to 1485

HIST 462 Qtr. Hrs. - 4 (4,0)
English History: 1485-1815

HIST 463 Qtr. Hrs. - 4 (4,0)
British History: 1815-Present

HIST 464 Qtr. Hrs. - 4 (4,0)
British Empire and Commonwealth: Development of the British Empire and Commonwealth since the American Revolution.

HIST 466 Qtr. Hrs. - 4 (4,0)
British History: Tudor-Stuart Period: A study of the Tudor-Stuart period, with particular emphasis on the civil/religious conflicts of the time.

HIST 470 Qtr. Hrs. - 4 (4,0)
History of Russia to 1801: Kievan State; Mongol Yoke; Development of Muscovite Expansionism and Absolutism; Time of Troubles; Westernization of Russia under Peter I and Catherine; Role of Orthodox Church.

HIST 471 Qtr. Hrs. - 4 (4,0)
History of Russia: 1801-1917: Alexander I; Napoleonic Invasion; Revolutionary Movement; Russian Policy toward Central Asia and China; Great Reforms; Russo-Japanese War; Revolution of 1905; Constitutional Period; Triple Entente.

HIST 472 Qtr. Hrs. - 4 (4,0)
History of the Soviet Union: 1917-Present: First War; 1917 Revolutions; Civil War; New Economic Policy; Stalin-Trotsky Struggle; Collectivization; Stalinist Purges; Second War; Post-Stalin Russia; Khrushchev; Sino-Soviet Relations.

HIST 473 Qtr. Hrs. - 4 (4,0)
Soviet Foreign Policy: 1917 to Present: Begins with Comintern policy, establishment of relations with capitalist countries, rise of Fascism, World War II, post-Stalin foreign policy.

HIST 480 Qtr. Hrs. - 4 (4,0)
History and Historians: PR: C.I. A study of European and/or American historiography. May be repeated once for credit.

HIST 501 Qtr. Hrs. - 2-5 (2-5,0)
Studies in American History: PR: Senior or graduate classification and permission of instructor. Advanced investigations into specific areas of American History. May be repeated for credit provided the topic under consideration is different.

HIST 510 Qtr. Hrs. - 2-5 (2-5,0)
Studies in World History: PR: Senior standing or graduate classification and C.I. Advanced investigations into specific areas of World History. May be repeated for credit provided the topic under consideration is different.

HUMANITIES

HUM 201 Qtr. Hrs. - 4 (4,0)
Landmarks in Western Humanities: Selected examples of man's creative achievements in literature, philosophy, art, music; inter-related to enlarge understanding of the nature of man and appreciation of human values.

HUM 401 Qtr. Hrs. - 4 (4,0)
The Ideal of Nature in the Arts: The search for identity with nature revealed in the arts of various times and cultures. Concerns feeling, imagination, subjectivity, creativity. Open to all upperclassmen.

HUM 402 Qtr. Hrs. - 4 (4,0)
The Classical Ideal in the Arts: The search for order and form reflected in the arts of Greece and later cultures. Concerns reason, structure, objectivity, harmony. Open to all upperclassmen.

HUM 403 Qtr. Hrs. - 4 (4,0)
The Spiritual Ideal in the Arts: The search for the meaning and experience of the sublime reflected in the arts. Spiritual impulses contrasted to pathos and ethos. Open to all upperclassmen.

HUMANITIES AND FINE ARTS

HFA 416 Qtr. Hrs. - 6-15
Supervised Special Training: Supervised special work experience. Open to students combining a major in Humanities and Fine Arts with Business Administration. Must be arranged in advance of registration.

HFA 490 Qtr. Hrs. - 2 (2,0)
Senior Seminar: Humanities and Arts in Human Affairs: A forum on the art and thought of the contemporary world as they provide insight into the recurring problems of human existence and as they relate to the search for fulfillment, self-awareness, and wholeness. Primarily intended for senior students. Offered as one of the Advanced Environmental Studies seminars. Not open to students majoring in the College of Humanities and Fine Arts.

INDUSTRIAL ENGINEERING AND MANAGEMENT SYSTEMS

IEMS 301 Qtr. Hrs. - 4 (3,2)
Management Standards: CR: ENGR 341 or equivalent. Management standards for evaluation and control of man and man-machine systems. Flow and operation analysis, work measurement, job evaluation, wage determination techniques. Laboratory assignments.

IEMS 311 Qtr. Hrs. - 4 (4,0)
Engineering Law: PR: Junior standing. Influence of contract, property and tort law, upon engineering activities; contracts, agency, partnerships, corporations, liens and expert testimony. Patents and licensing.

*IEMS 324 Qtr. Hrs. - 3 (3,0)
Production Management: PR: Sophomore Standing. Principles and methods of production viewed from a managerial decision-making level. ~~(Same as MGMT 324)~~

IEMS 332 Qtr. Hrs. - 3 (3,0)
Statistical Quality Control: Statistical concepts and methods applied to the control of quality of manufactured products. (Same as STAT 332.)

IEMS 412 Qtr. Hrs. - 4 (4,0)
Safety Engineering: PR: Junior standing. Basic principles of accident prevention in relation to hazards within workplace environment including machinery, flammable materials, pressure vessels and electrical hazards.

IEMS 413 Qtr. Hrs. - 4 (4,0)
Safety Administration: Organization of safety programs. Motivating safety habits and safety consciousness. Organizational aspects of accident prevention. Safety information systems and accident costs.

IEMS 414 Qtr. Hrs. - 4 (3,2)
Industrial Facilities Planning Design: PR: IEMS 301. Comprehensive design of industrial production systems including inter-relationships of plant location, process design, and materials handling. Laboratory assignments using computer and scale models.

IEMS 422 Qtr. Hrs. - 3 (2,2)
Network Analysis: PR: ENGR 442. Development, application and computerized analysis of networks for systems analysis and control. Applications of CPM, PERT, GERT, and maximal flow concepts.

IEMS 424 Qtr. Hrs. - 3 (3,0)
Management Control Systems: PR: ENGR 371. Management decision rules including mathematical and economic models of forecasting, scheduling, order, and inventory control problems. Lab assignments using computer algorithms.

IEMS 431 Qtr. Hrs. - 3 (3,0)
Engineering Applications of Computer Methods: PR: COMP 302 or equivalent. Structuring engineering problems for computers including computer characteristics and performance measure. Introduction to time sharing and computer aided design. Case studies and laboratory assignments.

IEMS 432 Qtr. Hrs. - 3 (2,2)
System Simulation with Digital Computers: PR: COMP 102 or equivalent. Methods and procedures for simulating large scale systems with digital computers, FORTRAN, CSMP and GPSS programming languages are used.

IEMS 441 Qtr. Hrs. - 4 (4,0)
Mathematical Systems Theory I: PR: MATH 331 and Senior standing. Concepts of linear systems analysis. Introduction to state and space techniques. Stable and unstable behavior of linear systems.

IEMS 443 Qtr. Hrs. - 3 (3,0)
Analysis of Decision Processes: PR: ENGR 371 and ENGR 341. Methods of making economic decisions; effects of risk, uncertainty, and strategy on managerial economic decision.

IEMS 447 Qtr. Hrs. - 3 (3,0)
Numerical Methods in Systems Analysis: PR: ENGR 371. Application of vector space and matrix concepts to systems problems. Analysis of linear transformations and simultaneous linear equations. Introduction to finite Markov processes.

IEMS 450 Qtr. Hrs. - 4 (3,2)
Biomedical Engineering: PR: ENGR 342 or C.I. Engineering description and analysis of living systems. Systems Analysis and its application to biomedical and ecological systems. Laboratory assignments.

IEMS 461 Qtr. Hrs. - 3 (2,2)
Human Engineering: PR: Senior standing. Man-machine systems; design and conduct of human engineering studies.

IEMS 463 Qtr. Hrs. - 4 (4,0)
Occupational Health: Industrial health hazards and occupational diseases. Control of health hazards; substitution of less toxic materials, process changes, segregation of hazardous processes, noise control, radiation hazards.

IEMS 470 Qtr. Hrs. - 3 (3,0)
Introduction to Public Systems Analysis: PR: ENGR 371 or equivalent. Application of probability and statistics to the analysis of public systems data. Operations research models and applications; economic decision-models; cost/benefit analysis.

IEMS 502 Qtr. Hrs. - 3 (3,0)
Probability for Engineers: PR: ENGR 371. Engineering application of probability, combinatorial analysis, sample space, events, probability, discrete and continuous random variables, and probability distributions. (Same as STAT 535).

IEMS 503 Qtr. Hrs. - 3 (3,0)
Statistics for Engineers: PR: ENGR 371. Engineering application of statistics, significance tests and confidence intervals, tests of hypotheses, simple and multiple regression and correlation. (Same as STAT 536).

IEMS 510 Qtr. Hrs. - 4 (3,2)
Industrial Fire Protection Engineering I: PR: Consent of instructor. Chemistry of combustion, fire hazards properties of materials, storage and handling. Fire protection standards, codes and regulations. Building and facilities design and construction.

IEMS 512 Qtr. Hrs. - 4 (3,2)
Industrial Security Systems Engr: PR: Consent of instructor. Consideration of security threats. Methods of detection/control with emphasis of design and layout of automatic alarm systems for intrusion detection.

IEMS 521 Qtr. Hrs. - 3 (3,0)
Engineering Reliability and Quality Assurance: PR: IEMS 332 or C.I. Design and management of reliability programs and quality assurance systems; mathematics of reliability.

IEMS 532 Qtr. Hrs. - 4 (4,0)
Management Information Systems I: PR: COMP 102 or equivalent. The design and implementation of computer-based Management Information Systems. Consideration is given to the organizational, managerial and economic aspects of MIS.

IEMS 541 Qtr. Hrs. - 4 (4,0)
Mathematical Systems Theory II: PR: IEMS 441 or equivalent. Introduction to non-linear analysis. Approximation methods and numerical solutions. Stability of non-linear systems. Systems examples to be taken from engineering, environmental science, and economics.

IEMS 550 Qtr. Hrs. - 4 (3,2)
Biomedical Instrumentation: PR: ENGR 342 or C.I. Theory and techniques of biological instrumentation systems including transducers and computers applications. The nature of biological signals, their detection, analysis and display.

IEMS 561 Qtr. Hrs. - 3 (2,2)
Human Performance: PR: IEMS 461 or C.I. A study of the factors affecting human acquisition of skills and level of performance attained. Includes a critical review of background research.

IEMS 602 Qtr. Hrs. - 3 (3,0)
Engineering Economic Analysis: PR: ENGR 341. The engineering economic audit, breakeven point analysis, variable budget control of manufacturing costs, cost analysis and product pricing.

~~*IEMS 324 per 73-74 Bulletin — Spring Quarter~~

IEMS 603 Qtr. Hrs. - 3 (3,0)
Analysis of Industrial Operations: PR: IEMS 602. Role of engineering economics and operations research in analysis of industrial operations. Includes application of linear programming, queueing, inventory model and decision theory case studies.

IEMS 610 Qtr. Hrs. - 3 (3,0)
Project Engineering: PR: Graduate standing. Role of the project engineer in research and development, emphasizing the sequence of steps from project proposal to project completion. Analytical techniques will be considered.

IEMS 611 Qtr. Hrs. - 4 (3,2)
Industrial Fire Protection Engineering II: PR: IEMS 510. Design/test of plant water supply systems. Methods of fire detection/control including design layout of automatic water, gas, powder extinguishment systems. Inspection/ maintenance procedures.

IEMS 620 Qtr. Hrs. - 3 (3,0)
Queueing Systems: PR: IEMS 502. Analysis of queueing systems and waiting line problems using analytical and Monte Carlo methods. Laboratory assignments.

IEMS 624 Qtr. Hrs. - 3 (3,0)
Operations Research I: PR: ENGR 442 or equivalent. Methods of operations research including formulation of models and derivation of solutions by optimization techniques; sequencing and replacement, linear programming, geometric and dynamic programming.

IEMS 625 Qtr. Hrs. - 4 (4,0)
Operations Research II: PR: IEMS 624. Introduction to stochastic models and techniques including queueing theory. Simulation, non-linear programming, calculus of variations, and forecasting.

IEMS 626 Qtr. Hrs. - 4 (4,0)
Linear Programming: PR: ENGR 442 or equivalent. Theoretical and computational aspects of linear programming and related topics. Includes simplex algorithms, duality theory and integer programming. Operational applications and computer solutions are emphasized.

IEMS 627 Qtr. Hrs. - 4 (4,0)
Non-linear Programming: PR: IEMS 524. Study of non-linear models and their solution. Topics in non-linear programming, separable programming, and geometric programming.

IEMS 628 Qtr. Hrs. - 4 (4,0)
Dynamic Programming: PR: IEMS 524. A study of the optimization of multistage decision processes based on the application of the principle of optimality. Stochastic and deterministic models are developed.

IEMS 640 Qtr. Hrs. - 4 (4,0)
Systems Dynamics: PR: COMP 102 or equivalent. Industrial dynamics and the use of computer-based simulation models for the improvement of management control systems. Use of Dynamo II computer simulation language.

IEMS 641 Qtr. Hrs. - 4 (4,0)
Mathematical Systems Theory III: PR: IEMS 541. Adaptive systems and trainable machines. Introduction to cybernetics and artificial intelligence.

IEMS 662 Qtr. Hrs. - 3 (3,0)
Computer Simulation of Human Behavior: PR: IEMS 432, IEMS 461 or C.I. Consideration of computer simulation techniques to model human performance. Evaluation of such models as stand alone programs or as components in system models.

IEMS 667 Qtr. Hrs. - 3 (3,0)
Man – Computer Interaction: PR: IEMS 461 or C.I. The elements of man-computer interactive systems; hardware and software considerations; requirements of CAI, CAD, and MIS applications; design difficulties found in these systems.

IEMS 671 Qtr. Hrs. - 3 (3,0)
Public Works Economics: PR: ENGR 341 or equivalent. Economic considerations in public works planning. The nature and objective functions of public works projects; cost estimating, cost allocation and pricing. Cost/benefit analysis on primary and secondary benefits from public works projects.

IEMS 672 Qtr. Hrs. - 4 (4,0)
Urban Dynamics: PR: IEMS 540. Development of dynamic and community systems models. Use of computer simulation to analyze governmental and private sector policies in selected areas such as housing programs, industrial growth, worker training programs, environmental quality control, urban planning and land use planning.

IEMS 678 Qtr. Hrs. - 3 (3,0)
Public Operating Systems Analysis: PR: ENGR 371 or equivalent. Establishment of data base for public operating systems, including identification of data requirements. Development of service demand and workload relationships, resource and manpower requirements.

IEMS 679 Qtr. Hrs. - 3 (3,0)
Public System Planning and Resource Allocation: PR: IEMS 678. Forecasting work load, demand rates, public services by correlation with census factors in geographical grid network. Application of operations research, computer simulation and analytical models.

ITALIAN

ITA 101 Qtr. Hrs. - 4 (4,1)
Elementary Italian Language and Civilization: Designed to initiate the student to the major language skills: listening, speaking, reading, and writing, in addition to an introduction to Italian culture.

ITA 102 Qtr. Hrs. - 4 (4,1)
Elementary Italian Language and Civilization: PR: ITA 101 or equivalent. Continuation of ITA 101.

ITA 103 Qtr. Hrs. - 4 (4,1)
Elementary Italian Language and Civilization: PR: ITA 102 or equivalent. Continuation of ITA 102.

J

JOURNALISM

JRN 319 Qtr. Hrs. - 5 (2,3)
Basic Reporting: PR: C.I., and student must have minimum ability to type. Development of skills in gathering and writing for the mass media.

JRN 321 Qtr. Hrs. - 4 (2,2)
Copy Editing: PR: COM 319. Fundamentals of copy editing for printed media, including selection, processing and display of news.

JRN 322 Qtr. Hrs. - 4 (4,0)
Information Processing: PR: JRN 321 or equivalent. Planning content and format of newspaper and other periodicals; layout; dummying, departmental editing, copy desk management.

JRN 323 Qtr. Hrs. - 4 (4,0)
Press Photography I: Learning the use of the still camera, darkroom procedures, role of the photographer.

JRN 324 Qtr. Hrs. - 4 (4,0)
Press Photography II: PR: JRN 323 or equivalent. Further study in the use of the still camera and darkroom procedures plus color photography.

JRN 330 Qtr. Hrs. - 4 (4,0)
History of American Journalism: Development of newspapers and magazines, the press associations and the growth of the electronic media.

JRN 331 Qtr. Hrs. - 3 (3,0)
Film Criticism: PR: C.I. The practice of writing movie reviews: students will review at least one film a week during the course.

JRN 420
Technical and
gathering of mat
of technical info

JRN 421 Qtr. Hrs. - 4 (4,0)
Editorial and Column Writing: PR: C.I. Building the editorial page, backgrounding and interpreting the news.

JRN 422 Qtr. Hrs. - 4 (4,0)
Public Affairs Reporting: PR: COM 319 or C.I. Study of community news sources, reporting courts, city and county government.

JRN 423 Qtr. Hrs. - 4 (4,0)
Writing for the Mass Media: PR: C.I. Students write for a certain segment of the mass media of their own choosing. Will include creative writing, article writing, etc. May be repeated for credit.

JRN 424 Qtr. Hrs. - 4 (4,0)
Critical Writing: PR: C.I. Practice in writing reviews of plays, concerts, and books.

JRN 425 Qtr. Hrs. - 4 (4,0)
Feature Writing: PR: C.I. Writing of feature articles for newspapers and magazines.

JRN 426 Qtr. Hrs. - 4 (4,0)
Political Cartooning I: PR: Evidence of drawing ability. The history and technique of the political cartoon plus marketing and syndication considerations.

JRN 427 Qtr. Hrs. - 4 (4,0)
Political Cartooning II: PR: JRN 426 or C.I. Further study into the technique of political cartooning.

JRN 430 Qtr. Hrs. - 4 (4,0)
The Newspaper in the Classroom: Study of the use of the newspaper as a teaching aid in the classroom. Designed for persons currently teaching or majoring in education.

JRN 431 Qtr. Hrs. - 4 (4,0)
International Communication and the Foreign Press: A study of the news communicating systems of the world, the role of foreign correspondents, the foreign press.

JRN 433 Qtr. Hrs. - 4 (4,0)
Propoganda and Psychological Warfare: Propaganda and psychological warfare principles with a study of the activities engaged in by nations.

JRN 440 Qtr. Hrs. - 4 (4,0)
Public Relations: Principles and practice of public relations, the means of gaining publicity and influencing people.

JRN 441 Qtr. Hrs. - 4 (4,0)
Public Relations Campaigns: is: PR: JRN 440. Planning and execution of a public relations campaign; use of research and coordination of elements of the campaign.

JRN 442 Qtr. Hrs. - 4 (4,0)
Institutional Public Relations: PR: JRN 440 or C.I. Principles and methods of public relations as practiced by educational, medical and corporate-related institutions.

JRN 468 Qtr. Hrs. - 4 (2,2) STET
Newspaper and Magazine Advertising: PR: C.I. A study of print advertising as it affects the retail advertiser; the mechanical requirements and limitations in print advertising.

JRN 464 Qtr. Hrs. - 4 (4,0)
Principles of Advertising: Fundamentals of advertising theory and practice, including social and economic aspects.

JRN 465 Qtr. Hrs. - 4 (4,0)
Advertising Meda: PR: JRN 434 or C.I. Evaluations of advertising media, their ability to serve the advertiser's communication needs and analysis used in determining media success.

JRN 466 Qtr. Hrs. - 4 (2,2)
Advertising Copy: PR: COM 464. The writing and preparation of advertising copy.

JRN 467 Qtr. Hrs. - 4 (4,0)
Advertising Campaigns: PR: COM 464, COM 465, JRN 466. The planning and execution of an advertising campaign; use of research and coordination of elements of the campaign.

JRN 464 4(4,0)
PRINCIPLES OF ADVERTISING: Analysis of field of advertising; purposes, techniques, media, organization, and role of research; economic and social aspects of advertising (Same as MKTG 364)

L

LEGAL SERVICES — ALLIED

LES 201 Qtr. Hrs. -4
Development of Anglo-American Law: An historical survey of the development of the principles and processes of the American Law from its origins in English common law to the present. (Same as HIST 210.)

LES 202 Qtr. Hrs. - 4
Law and Justice: An examination of the philosophical origins of various concepts of legal justice with emphasis on the Anglo-American system.

LES 301 Qtr. Hrs. - 4
Legal Doctrine and Methods: Examination of the rules, procedures and methods of the American legal system.

LES 302 Qtr. Hrs. - 4
Legal Investigation: A study of the processes and principles of collecting and analyzing evidence from the field.

LES 303 Qtr. Hrs. - 4
Comparative Legal Systems: A comparison of the Anglo-American system of law with those of selected contrasting cultures and nations.

LES 315 Qtr. Hrs. - 4
Administrative Law: Study of the law governing the structure and processes of public service agencies and government departments and bureaus.

LES 328 Qtr. Hrs. - 4
Land Use Law I: Study of the law governing land use including planning, zoning, subdivision and building regulations.

LES 342 Qtr. Hrs. - 4
Probate Law: Study of the law of probate: wills, trusts, estates, etc.

LES 374 Qtr. Hrs. - 4
Property Law: PR: BADM 271 or C.I. Includes bailments real and personal property, and security interests therein, insurance, suretyship, and guaranty. (Same as BADM 474).

LES 428 Qtr. Hrs. -4
Land Use Law II: Examination of recent statutory changes and judicial interpretations of land use law, especially vis-a-vis planning and environmental protection.

LES 442 Qtr. Hrs. - 4
Probate Law II: Examination of recent changes in and judicial interpretations of the law of probate.

LES 474 Qtr. Hrs. - 4
Real Property Law II: Examination of recent changes in and judicial interpretations of the law governing real property.

M

MANAGEMENT

*MGMT 301 Qtr. Hrs. - 3 (3,0)
Management and Organization Behavior: Fundamentals of management showing how the manager in any organization effectively performs the functions of planning, organizing, directing, and controlling.

MGMT 311 Qtr. Hrs. - 3
Human Behavior and Interpersonal Relations: PR: MGMT 301. Human behavior and its effect upon the operation of formal organizations.

MGMT 364 Qtr. Hrs. - 4 (4,0)
Personnel Management: PR: MGMT 301. An investigation of personnel practices and interpersonal relationships involved in managing employees. Internal problems of labor control and the utilization of human resources are considered.

MGMT 401 Qtr. Hrs. - 4 (4,0)
Organization Theory: PR: MGMT 301. Elements in organizations and the processes by which they develop and influence behavior are considered.

MGMT 402 Qtr. Hrs. - 4 (4,0)
Decision Systems Analysis: PR: COMP 303 or C.I. Decision systems as an instrument to assist in making competent business decisions. Design, installation, and operation of decision systems in a practical business environment.

MGMT 403 Qtr. Hrs. - 4 (4,0)
Managing Decision Systems: PR: MGMT 402. An introduction to the managerial competencies required to assure effective and efficient operation of a decision system after its installation.

MGMT 424 Qtr. Hrs. - 4 (4,0)
Production Management Problems: PR: ENGR 380. Problems in the management of industrial enterprise. Management principles and mathematical analysis applied to manufacturing; product development and production; materials and production control; employee relations.

MGMT 464 Qtr. Hrs. - 4 (4,0)
personnel Problems: PR: MGMT 364. Case studies in personnel problems directed toward the application of personnel management theory and concepts to organization problems.

MGMT 465 Qtr. Hrs. - 4 (4,0)
Industrial Relations: PR: MGMT 364 or C.I. The impact of trade unionism on industrial relations; current problems, conflicts and trends; the development of managerial approaches to achieve labor-management cooperation.

MGMT 466 Qtr. Hrs. - 4 (4,0)
Human Relations in Management: PR: MGMT 301. The individual, interpersonal and group relations and inter-group and organizational problems in business.

MGMT 501 Qtr. Hrs. - 4 (4,0)
Management and Production Concepts: PR: Acceptance into the M.B.A. Program. Fundamentals of management and production underlying the solution of problems relating to organization and operation of business enterprises.

MGMT 601 Qtr. Hrs. - 3 (3,0)
Planning and Control Analysis: PR: Graduate standing and MGMT 501 or equivalent. Emphasizes elements of the planning and control processes including objectives, action programs and control procedures. Discusses integration of the two processes.

MGMT 611 Qtr. Hrs. - 3 (3,0)
Analysis of Organizational Behavior: PR: Graduate standing and MGMT 501 or equivalent. The analysis of human behavior in organizations in terms of the individual, small group, intergroup relationships, and the total organization.

MGMT 621 Qtr. Hrs. - 3 (3,0)
Group Decisions and Analysis: PR: Graduate standing and MGMT 501 or equivalent. Experience in company-wide management decision-making by groups using the management game technique. Analysis of the group decision-making process using video tapes.

MGMT 650 Qtr. Hrs. - 3 (3,0)
Evolution of Administrative Management: PR: Graduate standing and MGMT 501 or equivalent. The historical development of managment in modern society with emphasis in the management process as applied within the economic, social, political, and legal environment.

MGMT 656 Qtr. Hrs. - 3 (3,0)
Research and Development Management: Graduate standing and MGMT 501 or equivalent. An examination of the function of Research and Development and the impact of technological innovation on our economic and social systems.

MARKETING

MKTG 301 Qtr. Hrs. - 5 (5,0)
Marketing: Study of functions, institutions and basic problems in marketing of goods and services in our economy.

MKTG 326 Qtr. Hrs. - 4 (4,0)
Consumer Market Behavior: PR: MKTG 301. An analysis of consumer motivation, buying behavior, market adjustment and product innovation. Behavorial aspects of the marketing process from producer to ultimate user or consumer are considered.

MKTG 334 Qtr. Hrs. 4 (4,0)
Marketing Models and Logistics: PR: MKTG 301 and ECON 321. Qualitative and quantitative model building concepts applied to marketing problems with special emphasis on product planning, distribution, promotion strategy, and pricing problems.

MKTG 364 Qtr. Hrs. - 4 (4,0)
Advertising ~~Management~~ Principles of: PR: Junior Standing. Analysis of field of advertising; techniques, media, organization, and role of research; economic and social aspects of advertising. (Same as JRN 464.)

MKTG 367 Qtr. Hrs. - 4 (4,0)
Sales Management: PR: MKTG 301. Problems confronting sales manager; training in sales techniques; sales objectives and policies; organization; administration of sales force.

MKTG 384 Qtr. Hrs. - 5 (5,0)
Marketing Research: PR: MKTG 301 and ECON 321. Study of research procedures and techniques applicable to problem solving in marketing. The marketing management process is analyzed; the underlying concepts related to the information needed to serve the processes are explored; the incorporation of information resources into the management function is demonstrated.

MKTG 469 Qtr. Hrs. - 4 (4,0)
Channels of Distribution Management: PR: MKTG 301. Study of marketing activities and relationship within channels of distribution. Major attention given to decision-making and formulation of policies appropriate for wholesalers, retailers, and vertically integrated marketing institutions.

MKTG 485 Qtr. Hrs. - 4 (4,0)
Marketing Policies and Strategies: PR: MKTG 384 and C.I. Marketing problems and policies are explored with emphasis placed on the decision-making process.

MKTG 489 Qtr. Hrs. - 4 (4,0)
Current Marketing Problems: PR: Senior standing, marketing major, and C.I. A course emphasizing the recognition and analysis of marketing problems arising from broad cultural, social, political, legal, economic, and competitive developments.

*MGMT 301 per 73-74 Bulletin — Spring Quarter

MKTG 501 Qtr. Hrs. - 4 (4,0)
Marketing Concepts: PR: Acceptance into the M.B.A. Program. Study of functions, institutions and basic problems in marketing of goods in our economy.

MKTG 601 Qtr. Hrs. - 3 (3,0)
Marketing Policy: PR: Graduate standing and MKTG 501 or equivalent. Marketing policy formulation and decision-making with respect to planning, pricing, promoting, and distributing.

MKTG 602 Qtr. Hrs. - 3 (3,0)
Current Marketing Problems: PR: Graduate standing and MKTG 501 or equivalent. Analysis of marketing problems stemming from broad social, economic, and political developments. Topics treated cover broad classes of marketing institutions.

MKTG 604 Qtr. Hrs. - 3 (3,0)
Sales Management and Control: PR: Graduate standing and MKTG 501 or equivalent. Emphasis is placed on the allocation and development of sales territories and the training, motivation, and supervision of a sales force.

MATHEMATICS

MATH 100 Qtr. Hrs. - 4 (4,0)
Principles of Mathematics: PR: Two years of high school mathematics. Selected topics in mathematics with primary emphasis on developing conceptual understanding and broadening insight into mathematics. Not intended for students in the Colleges of Business Administration, Engineering, or Natural Sciences.

MATH 101 Qtr. Hrs. - 4 (4,0)
Elementary School Mathematics I: PR: Two years of high school mathematics. Logic, sets, the system of whole numbers, numeration systems, the system of integers, the system of rational numbers. Open only to majors in elementary education.

MATH 104 Qtr. Hrs. - 4 (4,0)
Fundamental Algebra: Elementary algebra including factoring, plane coordinates, systems of linear equations, exponents and radicals, quadratic equations and inequalities, ratio, proportion, and logarithms. For those students whose preparation in mathematics is non-current or insufficient for MATH 106, 110, 111, and 115.

MATH 106 Qtr. Hrs. - 4 (4,0)
College Algebra: PR: MATH 104 or 2 years of high school algebra. Sets; exponential and polynomial functions; formula manipulation; graphs; linear equations; vectors; matrices. Not open to students with credit in MATH 110.

MATH 110 Qtr. Hrs. - 4 (4,0)
Precalculus Mathematics I: PR: MATH 104 or two years of high school algebra and one year of high school plane geometry. This course is intended to cover most of the topics usually found in college algebra emphasizing the notion of function.

MATH 111 Qtr. Hrs. - 4 (4,0)
Precalculus Mathematics II: PR: MATH 110 or equivalent (e.g., a course in college algebra which required the mastery of the function concept). Exponential and logarithmic functions; circular and trigonometric functions; inverses of circular functions; complex numbers.

MATH 115 Qtr. Hrs. - 4 (4,0)
Finite Mathematics: PR: MATH 104 or one and one half years of high school algebra and one year of plane geometry or two years of high school algebra. Mathematical logic, set theory, counting and the binomial theorem, probability.

MATH 201 Qtr. Hrs. 4 (4,0)
Elementary School Mathematics II: PR: MATH 101. The system of real numbers, polynomials, linear equations and inequalities, systems of equations and inequalities, quadratic equations and inequalities, the complex numbers. Open only to majors in elementary education.

MATH 211 Qtr. Hrs. - 3 (3,0)
Analytic Geometry: CR: MATH 111 or equivalent. Topics include coordinate systems; vectors; lines in the plane; lines and planes in space; conic sections; polar coordinates; transformation of coordinates.

MATH 271 Qtr. Hrs. - 3 (3,0)
Logic and Proof in Mathematics: PR: Four years of high school mathematics or equivalent. The course begins with basic mathematical logic and works up to methods of proof in mathematics. Primarily for mathematics majors.

MATH 272 Qtr. Hrs. - 3 (3,0)
Mathematical Structures: CR: MATH 271. An introduction to number theory, group theory, the number system.

MATH 301 Qtr. Hrs. - 4 (4,0)
Elementary School Mathematics III: PR: MATH 201 or C.I. Algebraic structures, selected topics from number theory, experimental and formal geometry. Open only to majors in elementary education.

MATH 311 Qtr. Hrs. - 4 (4,0)
Applied Calculus I: PR: College algebra and trigonometry. Differential and integral calculus applied to problems in engineering technology fields. Not open to students with credit in MATH 320 or MATH 321.

MATH 312 Qtr. Hrs. 4 (4,0)
Applied Calculus II: PR: MATH 311. Continuation of MATH 311.

MATH 314 Qtr. Hrs. 4 (4,0)
Boolean Algebra: PR: MATH 323 or C.I. Axiomatic development of Boolean algebra; the algebras of sets, logic and circuits as Boolean algebras.

MATH 315 Qtr. Hrs. - 3 (3,0)
Introduction to Number Theory: PR: C.I. Divisibility; primes and composites; divisors; multiples; Euclid's algorithm; Diophantine equations; modulo arithmetic; simple continued fractions. Intended for prospective teachers of mathematics.

MATH 316 Qtr. Hrs. - 3 (3,0)
Introduction to Number Theory II: PR: MATH 315. Continuation of MATH 315.

MATH 317 Qtr. Hrs. - 4 (4,0)
Matrices: PR: MATH 323. Elementary properties of matrices; special, real and complex matrices; determinants and inverses; rank and systems of equations; transformations; eigenvectors; diagonalization; quadratic forms.

MATH 318 Qtr. Hrs. - 3 (3,0)
Linear Algebra I: CR: MATH 272. A detailed analysis of finite dimensional linear spaces including bases, subspaces, dual spaces, quadratic forms, and applications to geometry.

MATH 319 Qtr. Hrs. - 3 (3,0)
Linear Algebra II: PR: MATH 318. Continuation of MATH 318.

MATH 320 Qtr. Hrs. - 4 (4,0)
Concepts of Calculus: PR: MATH 106 or equivalent. Differential and integral calculus of exponential and polynomial functions; optimization of multivariate functions; mathematical models. Not open to students with credit in MATH 321.

MATH 321 Qtr. Hrs. - 4 (4,0)
Calculus I: PR: MATH 110 and MATH 111 or equivalent; CR: MATH 211. The differential and integral calculus of elementary functions of one variable with attention to a variety of geometric and physical applications.

MATH 322 Qtr. Hrs. - 4 (4,0)
Calculus II: PR: MATH 321. Continuation of MATH 321.

MATH 323 Qtr. Hrs. - 4 (4,0)
Calculus III: PR: MATH 322. Continuation of MATH 322.

MATH 324 Qtr. Hrs. - 4 (4,0)
Intermediate Calculus: PR: MATH 323. Differential and integral calculus of functions of several variables with applications. Topics include vector differential calculus, partial derivatives; multiple integrals; line and surface integrals.

MATH 331 Qtr. Hrs. - 4 (4,0)
Differential Equations: PR: MATH 323. First order ordinary differential equations; constant coefficients; variation of parameters; step-by-step integration; methods of Picard and Frobenius; input-output analysis; transform methods.

MATH 341 Qtr. Hrs. - 3 (3,0)
Vector Analysis: PR: MATH 324. Derivatives and integrals of vector valued functions; the directional derivative and vector operators; the theorems of Green, Gauss, and Stokes; applications in engineering and physical sciences.

MATH 351 Qtr. Hrs. - 4 (4,0)
Foundations of Geometry: PR: C.I. Modern Euclidean geometry; logical defects in Euclid's geometry; simple axiomatic systems; introduction to finite and affine geometries. Intended for prospective teachers of mathematics.

MATH 411 Qtr. Hrs. - 3 (3,0)
Algebraic Structures I: PR: MATH 272. An introduction to the properties of groups, rings, polynomial rings, integral domains and fields.

MATH 412 Qtr. Hrs. - 3 (3,0)
Algebraic Structures II: PR: MATH 411. Continuation of MATH 411.

MATH 413 Qtr. Hrs. - 3 (3,0)
Algebraic Structures III: PR: MATH 412. Continuation of MATH 412.

MATH 420 Qtr. Hrs. - 3 (3,0)
Sequences and Series: PR: C.I. Convergence of infinite sequences and series; double series; infinite products. Intended for prospective teachers of mathematics.

MATH 421 Qtr. Hrs. - 3 (3,0)
Introduction to Analysis I: PR: MATH 272 and MATH 324. Limits, sequences and continuity; differentiation and integration; derivatives of integrals; infinite series and convergence; the Bolzano-Weierstrass theorem and the Heine-Borel theorem; extensions in Euclidean n-space.

MATH 422 Qtr. Hrs. - 3 (3,0)
Introduction to Analysis II: PR: MATH 421. Continuation of MATH 421.

MATH 423 Qtr. Hrs. - 3 (3,0)
Introduction to Analysis III: PR: MATH 422. Continuation of MATH 422.

MATH 424 Qtr. Hrs. - 3 (3,0)
Lebesgue Thoery: PR: MATH 423. Inner and outer measure; measurable sets and functions; the Lebesgue integral.

MATH 426 Qtr. Hrs. - 3 (3,0)
Complex Variables I: PR: MATH 324. Analytic and harmonic functions; mappings by complex functions; Cauchy's theorem and its implications; the maximum modulus principle; series expansions; the residue theorem and its applications.

MATH 427 Qtr. Hrs. - 3 (3,0)
Complex Variables II: PR: MATH 426. Analytic continuation; decomposition of meromorphic functions into partial fractions; Mittag-Leffler theorem; entire functions; Weierstrass's Factorization theorem; Riemann Mapping theorem.

MATH 428 Qtr. Hrs. - 3 (3,0)
The Number System: PR: C.I. An axiomatic development of the natural numbers followed by a constructive development of the real and complex numbers. Intended for prospective teachers of mathematics.

MATH 429 Qtr. Hrs. - 3 (3,0)
Foundations of Calculus: PR: C.I. Functions; limits; continuity; differentiation and integration. Study of the basic structure of the calculus and recommended for prospective teachers of mathematics.

MATH 431 Qtr. Hrs. - 4 (4,0)
Ordinary Differential Equations I: PR: MATH 323. First order differential equations; higher order differential equations; applications to mechanical and electrical systems, pursuit curves; Power series solutions and special functions.

MATH 432 Qtr. Hrs. - 4 (4,0)
Ordinary Differential Equations II: PR: MATH 431. Sturm-Liouville boundary value problems; systems of first order equations; Volterra's prey-predator equations; nonlinear equations; stability; Poincare'-Bendixson theorem; existence and uniqueness of solutions.

MATH 434 Qtr. Hrs. 3 (3,0)
Partial Differential Equations: PR: MATH 331. Separation of variables; orthogonality and Fourier series; classification of equations; solutions in different coordinate systems; methods of characteristics; the Fourier integral transform and Dirac's delta function.

MATH 435 Qtr. Hrs. - 3 (3,0)
Boundary Value Problems: PR: MATH 434. Adjoint forms and Green's functions; applications in engineering and the physical sciences.

MATH 437 Qtr. Hrs. - 3 (3,0)
Laplace Transforms: PR: MATH 331. Laplace and Z transforms; solutions of ordinary and partial differential equations; application to circuit analysis and difference equations.

MATH 438 Qtr. Hrs. - 3 (3,0)
Transform Calculus: PR: MATH 331. Fourier, Hankel and other transforms with applications to physical problems; the transformations of distributions.

MATH 451 Qtr. Hrs. - 3 (3,0)
Non-Euclidean and Projective Geometry I: PR: MATH 351 or C.I. Non-Euclidean geometry; projective plane, perspectivities, projectivities; projective theory of conics; analytic projective geometry; vector theory; linear theory; linear transformations in projective geometry.

MATH 452 Qtr. Hrs. - 3 (3,0)
Non-Euclidean and Projective Geometry II: PR: MATH 451. Continuation of MATH 451.

MATH 461 Qtr. Hrs. - 3 (3,0)
Topology I: PR: MATH 272. Metric spaces; topological spaces, limit points, connectedness; compactness; topology of surfaces; spheres with handles and crosscaps; Euler characteristics; topological invariants.

MATH 462 Qtr. Hrs. - 3 (3,0)
Topology II: PR: MATH 461. Continuation of MATH 461.

MATH 463 Qtr. Hrs. - 3 (3,0)
Topology III: PR: MATH 462. Continuation of MATH 462.

MATH ~~490~~ 440 Qtr. Hrs. - 3 (3,0)
History of Mathematics: PR: Five hours of mathematics. A chronological study of the evolution of mathematical thought from primitive counting through modern ideas of the twentieth century. Recommended for prospective teachers of mathematics.

MATH 511 Qtr. Hrs. - 4 (4,0)
Modern Applied Algebra: PR: MATH 324 or equivalent. Modern algebra for computer utilization and design: binary relations, finite state machines, groups. binary group coding, rings and ideals, polynomial codes.

MATH 521 Qtr. Hrs. - 3 (3,0)
Advanced Calculus I: PR: MATH 324. Differnetial and integral calculus of functions of several variables; vector differential calculus. Empahsis on applications.

MATH 525 Qtr. Hrs. - 3 (3,0)
Techniques of Complex Variables: PR: MATH 324. Analytic functions; integration in the complex plane; Laurent series and residue calculus, inversion of Laplace transforms; conformal mappings; applications in engineering and the physical sciences.

MATH 526 Qtr. Hrs. - 3 (3,0)
Methods of Mathematical Analysis I: PR: MATH 324 or equivalent. Mathematical analysis applied to boundary and eigenvalue problems: calculus of variations, vibrations of stretched strings and membranes, the potential equation, the heat equation, Fourier series.

MATH 535 Qtr. Hrs. - 3 (3,0)
Special Functions: PR: MATH 331. Series and integral representations, generating functions, recurrence relations, and orthogonality properties of the special functions. Emphasis on Bessel, Legendre, hypergeometric functions, other special functions.

MATH 621 Qtr. Hrs. - 3 (3,0)
Advanced Calculus II: PR: MATH 521. Continuation of MATH 521. Two and three-dimensional theory of vector integral calculus with applications; infinite series.

MATH 626 Qtr. Hrs. - 3 (3,0)
Methods of Mathematical Analysis II: PR: MATH 526. Topics include self adjod differential equations, the Sturm-Liouville problem, eigenvalues and eigenfunctions, variational methods, the Rayleigh Ritz method, Schrodinger's Wave equation, Green's functions.

MATH 633 Qtr. Hrs. - 3 (3,0)
Transform Theory: PR: MATH 525. Laplace, Fourier, Hankel and other integral transforms; inversion theorems; the Z transform; applications to physical problems.

MATH 641 Qtr. Hrs. - 3 (3,0)
Tensor Analysis: PR: MATH 341 or MATH 621 or equivalent. Contravariant and covariant tensors, metric tensors, geodesics, Christoffel symbols, covariant differentiation, curvature, Ricci tensor, Riemann-Christoffel tensor, and applications of tensors.

MATH 671 Qtr. Hrs. - 3 (3,0)
Approximation Theory: PR: MATH 423 or MATH 621. Normed linear spaces; Weierstrass approximation theorem; Tchebycheff approximation by polynomials; trigonometric approximation; orthogonal expansions and least squares approximations.

MECHANICAL ENGINEERING AND AEROSPACE SCIENCES

MEAS 341 Qtr. Hrs. - 3 (4,0)
Kinematics and Kinetics of Machines: PR: ENGR 311. Graphical, mathematical, and computer aided kinematic analysis and synthesis of basic mechanisms. Kinetic analysis of machines.

MEAS 342 Qtr. Hrs. - 4 (4,0)
Machine Design and Analysis: PR: MEAS 341. Application of concepts and principles of stress, deflection, strength, and fatigue analysis to machines design. Design Project.

MEAS 351 Qtr. Hrs. - 3 (2,2)
Measurement Systems: PR: ENGR 312 and ENGR 321. Application of system design concepts to measurements. Fundamental theory of static and dynamic measurements. Behavior of transducers individually and in open-loop systems. Validation of experimental data. Measurements are considered as information transfer accompanied by energy transfer.

MEAS 371 Qtr. Hrs. - 4 (4,0)
Fluid Mechanics: PR: ENGR 332. Continuation of ENGR 332. Topics in gas dynamics including shock waves, viscous flow analysis and solutions in boundary layer theory.

MEAS 382 Qtr. Hrs. - 4 (4,0)
Thermodynamics of Mechanical Systems: PR: ENGR 431. Applied thermodynamics, availability analysis, thermodynamics of reactive and non-reactive mixtures, thermodynamic relations of properties. Thermodynamic design analysis of complete mechanical systems.

MEAS 411 Qtr. Hrs. - 4 (3,2)
Aerodynamics: PR: ENGR 332. Principles of subsonic and supersonic flight; airfoils in compressible and incompressible flow; flow about a body; thin airfoil and finite airfoil theory.

MEAS 415 Qtr. Hrs. - 4 (4,0)
Space Mechanics: PR: ENGR 311. Dynamics with applications to aeronautical and astronautical problems, orbits and trajectories, motion in a resisting medium, performance and optimization of multistage rockets.

MEAS 423 Qtr. Hrs. - 4 (4,0)
Vibration Analysis: PR: ENGR 312. Undamped and damped vibrations of single degree of freedom systems. Forced vibrations, transient response. Many degrees of freedom systems, normal modes, vibration of elastic bodies.

MEAS 424 Qtr. Hrs. - 4 (4,0)
Flight Vehicle Structures: PR: ENGR 312. Space structures; thin-walled structures; load factors; non-symmetrical bending and transverse shear; shear center and shear flow; semimonocoque construction, fuselage rings; multicelled structures; sandwich panels, fatigue.

MEAS 432 Qtr. Hrs. - 4 (4,0)
Propulsion Systems: PR: ENGR 431. Analysis of jet propulsion systems including turbojets, ramjets, and rockets.

MEAS 436 Qtr. Hrs. - 3 (3,0)
Mechanical Power Systems: PR: ENGR 431. Analysis and design of large power generating systems and components thereof with emphasis on steam plants utilizing both chemical and nuclear fuels. Boiler, turbine, condenser, and auxiliary equipment design and performance analysis.

MEAS 441 Qtr. Hrs. - 3 (3,0)
Engineering Design and Analysis: PR: MEAS 341 and Senior standing. Problem formulations and definition, inventiveness enhancement, generalized physical principles, numerical and computer methods and optimization techniques.

MEAS 482 Qtr. Hrs. - 4 (3,2)
Heat Transfer: PR: ENGR 431. Steady state and transient conduction in one and two dimensions. Application of boundary layer theory to convective heat transfer analysis. Radiation heat transfer, analysis and design of heat exchangers.

MEAS 511 Qtr. Hrs. - 3 (3,0)
Aerodynamics: PR: MEAS 411 or equivalent. Advanced aerodynamic principles including fluid dynamics, potential flow theory, airfoil and finite wing theory.

MEAS 523 Qtr. Hrs. - 4 (4,0)
Acoustics: PR: C.I. Elements of vibration theory and wave motion; radiation, reflection, absorption, and transmission of acoustic waves; architectural acoustics; control and abatement of environmental noise pollution.

MEAS 537 Qtr. Hrs. - 3 (3,0)
Energy Conversion: PR: ENGR 431 and PHYS 344. Unconventional method of energy conversion; particular emphasis on fuel cells, thermoelectrics, thermionics, solar energy, photovoltaics, nuclear, and magnetohydrodynamics.

MEAS 538 Qtr. Hrs. - 3 (3,0)
Environmental Thermodynamics: PR: ENGR 431 or equivalent. Thermodynamics of the environment, computation of energy requirements; physiological reactions to the environment, air and gas distributions, control systems and cleaning of air and the atmosphere.

MEAS 542 Qtr. Hrs. - 3 (3,0)
Principles of Design: PR: MEAS 342 or equivalent. Engineering design algorithm, graphical and computer-aided kinematic synthesis and dynamic analysis. Machine materials and properties, tension torsion, bending, and strength under combined stresses.

MEAS 581 Qtr. Hrs. - 3 (3,0)
Statistical Thermodynamics: PR: ENGR 331. Statistical approach to thermodynamic concepts, laws, and methods of analysis. Generalized p-v-T data. Special systems.

MEAS 611 Qtr. Hrs. - 3 (3,0)
Aerodynamics: PR: MEAS 411 or equivalent. Theoretical methods useful for predicting performance and stability of thin lifting surfaces and slender vehicles at subsonic, supersonic and hypersonic speeds.

MEAS 613 Qtr. Hrs. - 3 (3,0)
Aeromechanics: PR: MEAS 413 or equivalent. Advanced applied aerodynamics including stability and control of aerospace vehicles. Generalized vehicle performance. Small disturbance dynamic stability and control response.

MEAS 632 Qtr. Hrs. - 3 (3,0)
Turbomachinery: PR: MEAS 432 or MEAS 436 or equivalent. Application of the principles of fluid mechanics, thermodynamics and aerodynamics to the design and analysis of pumps, compressors, and turbines.

MEAS 641 Qtr. Hrs. - 3 (3,0)
System Control: PR: ENGR 421 or equivalent. Theoretical, experimental and computer methods involved in the design of control systems. Emphasis on non-linear systems and advanced methods for control system analysis and optimization.

MEAS 642 Qtr. Hrs. - 3 (3,0)
Computer-Aided Design: PR: Graduate standing. Study and engineering application of computer-aided approaches to component and system feasibility study and design considerations computer graphics.

MEAS 643 Qtr. Hrs. - 3 (3,0)
Mechanical Design: PR: MEAS 542. Energy methods in design. Shock, impact, failure theories, thermal stress and pre-stressing for strength. Design using composite, honeycomb, reinforced materials and plastics.

MEAS 653 Qtr. Hrs. - 3 (2,2)
Advanced Engineering Instrumentation: PR: MEAS 351 or equivalent. Theoretical and experimental study of principles of operation, analysis and design techniques for systems of a mechanical and electromechanical nature.

MEAS 671 Qtr. Hrs. - 3 (3,0)
Gas Dynamics: PR: MEAS 371. Survey of gas dynamics from an advanced viewpoint. Fundamentals of wave phenomena. Shock waves and the analysis of steady and unsteady subsonic, supersonic and hypersonic flows.

MEAS 672 Qtr. Hrs. - 3 (3,0)
Gas Dynamics II: PR: MEAS 671. Continuation of MEAS 671.

MEAS 674 Qtr. Hrs. - 3 (3,0)
Mechanics of Viscous Flow I: PR: EMCS 471 or C.I. Principal concepts and methods for viscious fluid motion. Incompressible and compressible boundary layer analysis for laminar and turbulent flows.

MEAS 675 Qtr. Hrs. - 3 (3,0)
Mechanics of Viscous Flow II: PR: MEAS 674. Continuation of MEAS 674.

MEAS 676 Qtr. Hrs. - 3 (3,0)
Two Phase Flow: PR: C.I. General transport equations for multiphase systems including gas-liquid, gas-solid and liquid-solid systems.

MEAS 680 Qtr. Hrs. - 3 (3,0)
Classical Thermodynamics: PR: MEAS 372 or C.I. A general postulative approach to classical macroscopic thermodynamics featuring states as fundamental constructs. Conditions of equilibrium, stability criteria, thermodynamic potentials, Maxwell relations and phase trasitions.

MEAS 682 Qtr. Hrs. - 3 (3,0)
Combustion Phenomena: PR: MEAS 482. Physical and chemical aspects of combustion phenomena. Rate processes, chemical kinetics, structure, propagation, aerodynamics and stability of premixed and diffusion flames.

MEAS 685 Qtr. Hrs. - 3 (3,0)
Conduction Heat Transfer: PR: EMCS 574. Application of principles of heat transfer to the solution of steady and transient conduction heat transfer problems. Classical and numerical solutions will be considered.

MEAS 686 Qtr. Hrs. - 3 (3,0)
Convection Heat Transfer I: PR: MEAS 674 or C.I. Convective heat, mass and momentum transfer in laminar and turbulent flows. Emphasis on analysis and evaluation of heat transfer coefficients, heat exchanger theory and design.

MEAS 687 Qtr. Hrs. - 3 (3,0)
Convection Heat Transfer II: PR: MEAS 686. Continuation of MEAS 686.

MEAS 688 Qtr. Hrs. - 3 (3,0)
Radiation Heat Transfer: PR: MEAS 482 or C.I. Radiation properties and analysis of radiation heat transfer problems. Experimental techniques. Applications to space and solar energy utilization.

MEDICAL RECORD ADMINISTRATION

MRA 300 Qtr. Hrs. - 3 (2,2)
Medical Record Administration: An introduction to the field of medical record administration.

MRA 301 Qtr. Hrs. - 5 (3,4)
Evaluation of Patient Care: PR: MRA 300 or C.I. Problem oriented medical record; accreditation, certification; health statistics; release of information; medical staff committees; prospective, concurrent and retrospective evaluation techniques.

MRA 302 Qtr. Hrs. - 5 (3,4)
Coding and Indexing Procedures: PR: AHS 305. Special registries; nomenclatures; coding and indexing; application of indices to research.

MRA 370 Qtr. Hrs. - 1 (0,4)
Directed Experience I: PR: AHS 305 and MRA 300. Transcription and interdepartmental experience in selected health care facilities.

MRA 371 Qtr. Hrs. - 1 (0,4)
Directed Experience II: PR: MRA 370. Application in a health record facility of the principles of filing; quantitative, qualitative record analysis; correspondence; microfilming; coding and indexing procedures.

MRA 403 Qtr. Hrs. - 5 (3,4)
Health Care Records: PR: MRA 301 or C.I. Medical record standards and procedures for long term, ambulatory, home care, and other health care institutions. Field trips.

MRA 421 Qtr. Hrs. - 3 (2,2)
Analysis of Medical Record Department Operations: PR: AHS 420. Forms analysis and control; work distribution and simplification; other evaluation techniques.

MRA 472 Qtr. Hrs. - 2 (0,8)
Directed Experience III: PR: MRA 371. Supervised management experience in the medical record department of an approved health care facility.

MRA 473 Qtr. Hrs. - 2 (0,8)
Directed Experience IV: PR: MRA 472. Continuation of MRA 472.

MRA 474 Qtr. Hrs. - 2 (0,8)
Management Affiliation: PR: MRA 473, Two weeks of affiliation (80 hours) at a selected health care facility serving in an administrative capacity under the direction of a Registered Record Aministrator.

MRA 492 Qtr. Hrs. - 3 (3,0)
Medical Record Seminar: PR: Senior standing. Discuss and problem-solving using the case-method approach for the purpose of coordinating knowledge, skills and experience in medical record administration.

MEDICAL TECHNOLOGY

MEDT 440 Qtr. Hrs. - 9
Clinical Bacteriology: PR: Admission to Medical Technology Internship or C.I. Isolation and identification of pathogenic bacteria by culture and serological methods.

MEDT 442 Qtr. Hrs. - 10
Clinical Chemistry: PR: Admission to Medical Technology Internship or C.I. Instruction and laboratory practice in clinical chemistry.

MEDT 443 Qtr. Hrs. - 5
Clinical Blood Banking: PR: Admission to Medical Technology Internship or C.I. Instruction and laboratory practice in clinical blood banking.

MEDT 444 Qtr. Hrs. - 10
Clinical Hematology: PR: Admission to Medical Technology Internship or C.I. Instruction and laboratory practice in clinical hematology.

MEDT 445 Qtr. Hrs. - 1
Clinical Mycology: PR: Admission to Medical Technology Internship or C.I. Instruction and laboratory practice in the isolation and indentification of fungi associated with mycotic infections of man.

MEDT 446 Qtr. Hrs. - 3
Clinical Parasitology: PR: Admission to Medical Technology Internship or C.I. Instruction and laboratory practice in the examination and study of clinical material for the detection and identification of animal parasites.

MEDT 447 Qtr. Hrs. - 3
Clinical Serology: PR: Admission to Medical Technology Internship or C.I. Instruction and laboratory practice in serological methods used in diagnosis and study of disease.

MEDT 448 Qtr. Hrs. - 3
Clinical Urinalysis: PR: Admission to Medical Technology Internship or C.I. Instruction and laboratory practice in urinalysis.

MEDT 449 Qtr. Hrs. - 2
Clinical Coagulation: PR: Admission to Medical Technology Internship or C.I. Instruction and laboratory practice in coagulation. Theory and techniques.

MICROBIOLOGY

MICR 200 Qtr. Hrs. - 4 (3,4)
General Microbiology: PR: A college course in chemistry and 8 hours of biological science. Fundamentals of microbiology, microbial morphology, metabolismm and laboratory techniques.

MICR 210 Qtr. Hrs. - 3 (1,4)
Culture Media and Reagents: PR: MICR 200. Preparation of differential, selective and enrichment media; reagents used in microbiology; instrumentation used in culture media proparation.

MICR 300 Qtr. Hrs. - 5 (3,6)
Biology of Microorganisms: PR: MICR 200; CR: CHEM 321 or CHEM 113. Concepts and experimental methods in microbiology.

MICR 320 Qtr. Hrs. - 4 (3,4)
Pathogenic Microbiology: PR: MICR 300 or C.I. Microorganisms producing disease in man and other animals; means of transmission; protection against disease.

MICR 381 Qtr. Hrs. - 3 (2,2)
Immunology: PR: One year of biological sciences. Basic principles of the immune reaction; antigens, antibody formation, hypersensitivity and autoimmunity.

MICR 382 Qtr. Hrs. - 3 (1,6)
Serology: PR: MICR 381. Laboratory exercises in the production of antibodies, agglutination and precipitin reactions; quantitative techniques and isohemoagglutination.

MICR 410 Qtr. Hrs. - 5 (2,6)
Diagnostic Microbiology: PR: MICR 320. Techniques used in identifying bacteria which are pathogenic to man.

MICR 422 Qtr. Hrs. - 4 (3,4)
Microbiology of Water and Waste: PR: MICR 300. Organisms in water and their relationship to production and distribution of potable water; disposal of sewage.

MICR 430 Qtr. Hrs. - 4 (3,4)
Microbial Physiology: PR: MICR 300 and CHEM 442. Relationship between structure and function in microorganisms.

MICR 440 Qtr. Hrs. - 4 (3,4)
Determinative Microbiology: PR: MICR 300. Microbial classification, rules of nomenclature, bacterial code and identification of species.

MICR 451 Qtr. Hrs. - 4 (3,4)
Microbial Ecology: PR: BIOL 350 and MICR 300. Study of the roles of microbes in the environment.

MICR 485 Qtr. Hrs. - 4 (3,3)
Medical Mycology: PR: MICR 300 and C.I. Etiology, mycology and clinical aspects of fungal induced human diseases.

MICR 524 Qtr. Hrs. - 3 (3,0)
Infectious Process: PR: MICR 300 and C.I. Discussion of current theories of the infectious process and the response of cells and tissue to infection.

MICR 570 Qtr. Hrs. - 4 (3,4)
Virology: MICR 300 and CHEM 442. Nature of viruses and Rickettsiae, including their structure, propagation, isolation and identification.

MICR 581 Qtr. Hrs. - 4 (2,4)
Applied Microbiology: PR: MICR 300 or C.I. Microbiology of consumer products; role of microorganisms in world food production and deterioration of consumer products; quality control.

MICR 633 Qtr. Hrs. - 5 (3,4)
Microbial Metabolism: PR: C.I. Relationship between microbial metabolism and principal cellular activities, emphasizing transport, respiration, differentiation, and syntheses.

MICR 671 Qtr. Hrs. - 4 (4,0)
Contemporary Studies in Microbiology: PR: Graduate standing. Analysis of current publications and developments in microbiology and health science.

MUSIC

MUS 100 Qtr. Hrs. - 0 (3,0)
Music Forum: A series of special musical events required of music majors. Includes lectures and recitals by faculty, students, and guest artists.

MUS 101 Qtr. Hrs. - 3 (0,3)
Music Fundamentals: Introduction to basic musical elements, development of the student's skills in writing, performance, and analysis. Credit not applicable toward music degree.

MUS 102 Qtr. Hrs. - 3 (0,3)
Music Fundamentals: PR: C.I. Continuation of MUS 101.

MUS 103 Qtr. Hrs. - 3 (0,3)
Music Fundamentals: PR: C.I. Continuation of MUS 102.

MUS 104 Qtr. Hrs. - 1 (1,1)
Secondary Performance: Private and/or class instruction. Credit applicable toward music degree if not in student's principal performing medium; open to non-music majors. May be repeated for credit.

MUS 105 Qtr. Hrs. - 1 (0,2)
Class Piano I: Class instruction for beginning piano students. Not open to music majors whose major performing medium is piano. May be repeated for credit.

MUS 106 Qtr. Hrs. - 1 (0,2)
Class Piano II: PR: MUS 105 or C.I. Not open to music majors whose major performing medium is piano. May be repeated for credit.

MUS 107 Qtr. Hrs. - 1 (0,2)
Class Piano III: PR: MUS 106 or C.I. Preparation for the piano proficiency examination. May be repeated for credit.

MUS 108 Qtr. Hrs. - 1 (1,1)
Class Piano IV: PR: MUS 107 or C.I. Individualized instruction. Credit applicable toward music degree by non-piano majors; open to non-music majors. May be repeated for credit.

MUS 201 Qtr. Hrs. - 4 (2,4)
Musicianship: PR: MUS 103 or Satisfactory placement test. Required of music majors; writing, performance, analysis of music; emphasis on present-day experimental music and twentieth century music.

MUS 202 Qtr. Hrs. - 4 (2,4)
Musicianship: PR: MUS 201. Continuation of MUS 201.

MUS 203 Qtr. Hrs. - 4 (2,4)
Musicianship: PR: MUS 202. Continuation of MUS 202.

MUS 204 Qtr. Hrs. - 4 (1,7)
Principal Performance I: PR: Faculty jury. Required of music majors; private and class lessons plus assigned major performing organization and chamber music ensemble. May be repeated for credit.

MUS 210 Qtr. Hrs. - 4 (3,1)
Enjoyment of Music: Open only to non-music majors. Instruction designed to develop an understanding of basic musical principles and improved techniques for listening to music.

MUS 301 Qtr. Hrs. - 4 (2,4)
Musicianship: PR: MUS 203. Required of music majors; continuation of MUS 201-203; writing, performance, analysis of music of seventeenth-nineteenth centuries as related to present-day music.

MUS 302 Qtr. Hrs. - 4 (2,4)
Musicianship: PR: MUS 301. Continuation of MUS 301.

MUS 303 Qtr. Hrs. - 4 (2,4)
Musicianship: PR: MUS 302. Continuation of MUS 302.

MUS 304 Qtr. Hrs. - 4 (1,7)
Principal Performance II: PR: Necessary competence at MUS 204 level determined by faculty jury. Required of music majors. May be repeated for credit.

MUS 305 Qtr. Hrs. - 1 (0,4)
Major Performing Organizations: PR: C.I. Open to all students. Study and performance of music for large ensembles. May be repeated for credit; credit not applicable toward music degree.

MUS 306 Qtr. Hrs. - 1 (0,3)
Chamber Music Ensembles: PR: C.I. Open to all students. Study and performance of music for small ensembles. May be repeated for credit; credit not applicable toward music degree.

MUS 310 Qtr. Hrs. - 2 (0,2)
Beginning Recorder: Open to all non-music students. Class instruction in beginning recorder playing.

MUS 401 Qtr. Hrs. - 4 (2,3)
Musicianship: PR: MUS 303. Required of music majors; continuation of MUS 301-303; writing, performance, analysis of Western European music to 1600 as related to present-day music.

MUS 402 Qtr. Hrs. - 4 (2,3)
Musicianship: PR: MUS 401. Continuation of MUS 401.

MUS 403 Qtr. Hrs. - 4 (2,3)
Musicianship: PR: MUS 402. Continuation of MUS 402.

MUS 404 Qtr. Hrs. - 4 (1,7)
Principal Performance III: PR: Satisfactory piano proficiency examination and necessary competence at MUS 304 level determined by faculty jury. Required of music majors. May be repeated for credit.

MUS 474 Qtr. Hrs. - 1,6 (0,3-13)
Directed Experience: PR: C.I. Required of music majors; experience in communicating music under qualified teachers. Credit determined by number of hours assigned per week. May be repeated.

MUS 484 Qtr. Hrs. - 4 (1-7)
Principal Performance IV: PR: Necessary competence at MUS 404 level determined by faculty jury. Required of music majors. May be repeated for credit.

P

PHILOSOPHY

PHI 105 Qtr. Hrs. - 4 (4,0)
Critical Thinking: An examination of fallacies and other logical abuses in conjunction with an analysis of traditional modes in an attempt to encourage meaningful thought and usage.

PHI 205 Qtr. Hrs. - 4 (4,0)
Formal Logic I: Analysis of logical form and of procedures used in deductive inference, of the kind underlying mathematical reasoning.

PHI 221 Qtr. Hrs. - 4 (4,0)
Introduction to Philosophy: Inquiry into the meaning and justification of fundamental ideas and beliefs concerning reality, knowledge, and values; application to relevant topics in ethics, religion, and politics.

PHI 301 Qtr. Hrs. - 4 (4,0)
Ancient Philosophy: Foundations of Western philosophy in ancient Greek thinking about man and nature, including the pre-Socratics, Socrates, Plato, Aristotle.

PHI 302 Qtr. Hrs. - 4 (4,0)
Medieval and Early Modern Philosophy: Faith, reason and skepticism in the development of philosophy from the Scholastics to Hume; Continental Rationalism and British Empiricism.

PHI 303 Qtr. Hrs. - 4 (4,0)
Late Modern Philosophy: Relativism and atheism in the development of philosophy from Kant to Nietzsche; the challenge of science and religion to philosophy.

PHI 305 Qtr. Hrs. - 4 (4,0)
Formal Logic II: PR: PHI 205. Systematic study of propositional and first-order predicate logic; logistic systems and axiomatic methods; problems of metatheory, including consistency, completeness and decidability.

PHI 312 Qtr. Hrs. - 4 (4,0)
Existentialism: Study of existentialist analysis and criticism of the human situation as found in the writings of such philosophers as Kierkegaard, Nietzsche, Heidegger, Sartre, and Camus.

PHI 314 Qtr. Hrs. - 4 (4,0)
Problems in Contemporary Philosophy: Prominent issues and trends in 20th-century philosophy, excluding Existentialism.

PHI 331 Qtr. Hrs. - 4 (4,0)
Ethics: An examination of the nature of moral problems, judgments and principles with an emphasis on recent formulations in ethical theory.

PHI 341 Qtr. Hrs. - 4 (4,0)
Aesthetics: An investigation into the nature of human artistic experience with special reference to the problems of creativity.

PHI 401 Qtr. Hrs. - 4 (4,0)
Philosophically analyzes and evaluates selected issues arising from interaction of the individual, society, and the state.

PHI 405 Qtr. Hrs. - 4 (4,0)
Philosophy of Religion: An examination of basic ideas, beliefs, attitudes and functions of religion; the significance of religion in human experience.

PHI 407 Qtr. Hrs. - 4 (4,0)
Philosophy of Literature: An examination of fictional and non-fictional prose as it determines and reflects social, political, economic, and religious institutions. Includes works by Sartre, Feuchtwanger, and Zola.

PHI 409 Qtr. Hrs. - 4 (4,0)
Philosophy of Science: An examination of the conceptual foundations and methodology of modern science.

PHI 461 Qtr. Hrs. - 4 (4,0)
The Secular View: Examination of the philosophical foundations of secularism and of literary and political humanism, based on the work of Erasmus, Montaigne, Voltaire, Hobbes, Locke, and Rousseau.

PHYSICS

PHYS 100 Qtr. Hrs. - 4 (4,0)
Physical Science: Familiarization with the basic laws governing our universe and man's physical environment. Satisfies science requirements of the Environmental Studies Program.

PHYS 103 Qtr. Hrs. - 4 (4,0)
Astronomy I: Descriptive survey of solar system, galaxies and universe. Physical properties of stars deduced from their radiation. Night observation sessions. Appropriate for the Environmental Studies Program.

PHYS 201 Qtr. Hrs. - 4 (3,3)
College Physics I: PR: Two years of high school mathematics. Lectures and laboratory experiments, with special application to life sciences: mechanics, thermodynamics, electricity, magnetism, optics, sound, quantum and nuclear physics.

PHYS 202 Qtr. Hrs. - 4 (3,3)
College Physics II: PR: PHYS 201 or C.I. Continuation of College Physics sequence.

PHYS 211 Qtr. Hrs. - 4 (4,0)
General Physics I: CR: MATH 321. The first course in a sequence covering the basic principles of classical mechanics, thermodynamics, electricity, magnetism, optics and modern physics.

PHYS 212 Qtr. Hrs. - 4 (4,0)
General Physics II: PR: PHYS 211; CR: MATH 322. Continuation of the General Physics sequence.

PHYS 213 Qtr. Hrs. - 4 (4,0)
General Physics III: PR: PHYS 212; CR: MATH 323. Continuation of the General Physics sequence.

PHYS 282 Qtr. Hrs. - 1 (0,3)
General Physics Laboratory: PR: PHYS 211. Laboratory experimentation and instruction covering selected topics in physics.

PHYS 283 Qtr. Hrs. - 1 (0,3)
General Physics Laboratory II: PR: PHYS 282 or C.I. Continuation of physics laboratory instruction.

PHYS 301 Qtr. Hrs. - 3 (1,3)
Project Physics: "Hands-on" lecture-laboratory course, particularly for Elementary Education majors and prospective Junior High science teachers. Topics range from naked-eye astronomy to radioactive dating.

PHYS 302 Qtr. Hrs. - 3 (1,3)
Project Physics II: PR: PHYS 301 or C.I. Continuation of Project Physics sequence.

PHYS 303 Qtr. Hrs. - 3 (1,3)
Project Physics III: PR: PHYS 302 or C.I. Continuation of Project Physics sequence.

PHYS 304 Qtr. Hrs. - 4 (4,0)
Astronomy II: PR: PHYS 103 or equivalent. A continuation of PHYS 103 with emphasis on stellar and galactic evolution and recent discoveries in astronomy. Appropriate for the Environmental Studies Program.

PHYS 307 Qtr. Hrs. - 3 (3,0)
Biophysics: PR: College physics or C.I. Physics of Biosystems, viewed as optimal control systems with constraints imposed by energy transfer mechanisms, and examined by considering energy, information, and cybernetics.

PHYS 311 Qtr. Hrs. - 4 (4,0)
Intermediate Physics I: PR: PHYS 213 or C.I.; CR: MATH 323. First course in a sequence covering mechanics, vectors, coordinate transformations, rigid-body dynamics, electrostatics, electrodynamics, Maxwell's equations, special relativity, radiation, atomic, nuclear, and solid state physics, wave guides, physical optics, wavemotion, quantum statistics in thermodynamics, and kinetic theory.

PHYS 312 Qtr. Hrs. - 4 (4,0)
Intermediate Physics II: PR: PHYS 311 or C.I.; CR: MATH 324. Continuation of the Intermediate Physics sequence.

PHYS 313 Qtr. Hrs. - 4 (4,0)
Intermediate Physics III: PR: PHYS 312 or C.I.; CR: MATH 331. Continuation of the Intermediate Physics sequence.

PHYS 314 Qtr. Hrs. - 4 (4,0)
Intermediate Physics IV: PR: PHYS 313 or C.I. Continuation of the Intermediate Physics sequence.

PHYS 315 Qtr. Hrs. - 4 (4,0)
Intermediate Physics V: PR: PHYS 314 or C.I. Continuation of the Intermediate Physics sequence.

PHYS 335 Qtr. Hrs. - 3 (3,0)
Electronics: PR: PHYS 212, CR MATH 331, or C.I. Basic DC and AC circuit analysis. Theory of semiconductors and transistors, rectification, amplification, oscillation. Small signal analysis, and circuit design.

PHYS 343 Qtr. Hrs. - 4 (3,2)
Computer Methods in Physics I: PR: PHYS 211 and COMP 102 or C.I. Non-analytical problems in physics and astronomy, supplementary to the Physics 211, 212, 213 sequence, solved by approximation methods with computer assistance.

PHYS 344 Qtr. Hrs. - 3 (3,0)
Modern Physics for Engineers: PR: ~~ENGR 221 and MATH 331~~, PHYS 354. Selected topics in atomic, nuclear, molecular, and solid state physics. A study of spectroscopy, X-rays, nuclear radiation, and cosmic rays.

PHYS 345 Qtr. Hrs. - 3 (3,1)
Astrophysics: PR: PHYS 213 or equivalent. Theories of evolution of stars and planets, models of stellar interiors, properties of stellar atmospheres and spectra. Night sessions for photography.

PHYS 354 Qtr. Hrs. - 3 (3,0)
Optics and Wave Motion for Engineers: PR: ENGR 221 and MATH 331. Selected topics in optics, acoustics, and related wave phenomena. A study of reflection, refraction, interference, and diffraction.

PHYS 380 Qtr. Hrs. - 4 (3,3)
Physics of Scientific Instruments: PR: PHYS 202 or C.I. A lecture-laboratory course in fundamentals of physics related particularly to the application, operation and limitations of various scienfitic instruments.

PHYS 381 Qtr. Hrs. - 4 (2,4)
Physics Laboratory — Electronics: PR: PHYS 335 or C.I. Lecture and laboratory work stressing electronic principles through the study of test equipment, power supplies, amplifiers, oscillators, and pulse circuits.

PHYS 382 Qtr. Hrs. 4 (0,6)
Physics Laboratory — Intermediate: PR: PHYS 213 or C.I. Laboratory work in basic measurements of physical constants; intermediate level experiments in electronics, modern physics, nuclear physics, optics and solid state physics.

PHYS 383 Qtr. Hrs. - 4 (0,6)
Intermediate Physics Laboratory II: PR: PHYS 382 or C.I. Continuation of physics laboratory instruction.

PHYS 443 Qtr. Hrs. - 3 (2,2)
Computer Methods in Physics II: PR: PHYS 311 and COMP 102 or C.I. Examples and problems in physics from classical mechanics, electromagnetic theory and wave mechanics are solved using numerical techniques with computer assistance.

PHYS 451 Qtr. Hrs. - 3 (3,0)
Optics: PR: MATH 331 and PHYS 312 or PHYS 354 or C.I. A study of modern approaches to refraction, interference, diffraction, polarization, scattering, absorption and stimulated emission, spectroscopy and lasers.

PHYS 461 Qtr. Hrs. - 3 (3,0)
Solid State Physics: PR: PHYS 341 or C.I. Properties of solids, crystal binding, free electron model, band theory of solids, Fermi surface, and solid state applications.

PHYS 471 Qtr. Hrs. - 3 (3,0)
Quantum Mechanics: PR: PHYS 341 or C.I. A study of the postulates of quantum mechanics, the Schrodinger equation, and an introduction to the statistics of many particle systems.

PHYS 477 Qtr. Hrs. - 3 (3,0)
Nuclear Physics: PR: PHYS 314 and MATH 331 or C.I. Nuclear force, structure, moments, and models. Alpha decay, beta decay, gamma-ray emission, nuclear reactions and applications of nuclear physics.

PHYS 481 Qtr. Hrs. - 4 (0,6)
Advanced Physics Laboratory: PR: PHYS 382 or C.I. Experiments in optics, electronics; atomic, molecular, nuclear, solid state physics; emphasis on design, data and scientific writing.

POLITICAL SCIENCE

PCL 201 Qtr. Hrs. - 4 (4,0)
American National Government: A study of the dynamics of American national government, including its structure, organization, powers, and procedures.

PCL 300 Qtr. Hrs. - 4 (4,0)
State Government: PR: PCL 201, PCL 303 or C.I. A comparative study of American state governments and political processes with emphasis on Florida.

PCL 302 Qtr. Hrs. - 4 (4,0)
Scope and Methods of Political Science: Introduction to the Scope and Methodology of contemporary political analysis. Topics include scope of the discipline, research design, and methods.

PCL 303 Qtr. Hrs. - 4 (4,0)
Principles of Political Science: Basic concepts of political science and its development as a field with emphasis on areas of concern; analysis of major approaches to the study of politics.

PCL 305 Qtr. Hrs. - 4 (4,0)
Political Parties and Processes: PR: PCL 201 and PCL 303, or C.I. Study of American politics with major emphasis upon the role, organization, functions, and future processes of parties in the American political system.

PCL 306 Qtr. Hrs. - 4 (4,0)
Interest Groups and Political Movements: PR: PCL 201 or C.I. A study of the role of interest groups in the American political process and a comparison of varying political objectives and strategies used by the groups.

PCL 308 Qtr. Hrs. - 4 (4,0)
The American Presidency: PR: PCL 201 and PCL 303 or C.I. Examination of the presidency as an institution and of the evolution in status, powers, administrative responsibilities, leadership and decision-making roles.

PCL 310 Qtr. Hrs. - 4 (4,0)
Congress and the Legislative Process: PR: PCL 201 and PCL 303 or C.I. The nature, role, and functions of the legislative process; the dynamics of executive-legislative relations and resultant problems.

PCL 312 Qtr. Hrs. - 4 (4,0)
Minorities in American Politics: PR: PCL 201 and PCL 303 or C.I. The past and contemporary roles of minority groups in the American political system; their impact upon the legislative, executive, and judicial processes.

PCL 315 Qtr. Hrs. - 4 (4, 0)
Public Opinion: A substantive and theoretical study of public opinion: patterns of distribution, opinion formation, opinion measurement, policy linkages.

PCL 316 Qtr. Hrs. - 4 (4,0)
Electoral Behavior: Theoretical and substantive inquiry into U.S. electoral behavior: a study of the factors influencing participation and voting behavior.

PCL 321 Qtr. Hrs. - 4 (4,0)
International Relations: PR: PCL 201 and PCL 303 or C.I. Analysis of the fundamental principles and factors affecting interstate relations; the foreign policy decision-making processes of states.

PCL 322 Qtr. Hrs. - 4 (4,0)
World Political Geography: Analysis of the types and distributions of political systems, review of factors which affect relative power of diverse politics, areas of conflict and arbitration.

PCL 323 Qtr. Hrs. - 4 (4,0)
Contemporary International Politics: PR: PCL 201 and PCL 303 or C.I. Application of the theory and fundamentals of international politics to contemporary world affairs with attention to the impact of current developments upon the international system.

PCL 324 Qtr. Hrs. - 4 (4,0)
Urban Geography: The city as a geographical phenomenon created by human effort, its historical developemnt; patterns of land use as related to economic, sociological and political influences.

PCL 341 Qtr. Hrs. - 4 (4,0)
Comparative European Politics: PR: PCL 201 and PCL 303 or C.I. An analytical and comparative study of the major governments of Europe and their impact upon the development of types of political systems.

PCL 342 Qtr. Hrs. - 4 (4,0)
Nationalism: A Systematic Analysis: Theories of modern nationalism as a world-wide political phenomenon including problems of: nationalistic wars and rebellions, multi-nation states, trans-national organizations.

PCL 343 Qtr. Hrs. - 4 (4,0)
Politics of Developing Areas: PR: PCL 201 and PCL 303 or C.I. An analysis of non-Western political systems with emphasis upon the problems of political, socio-economic, and cultural development.

PCL 344 Qtr. Hrs. - 4 (4,0)
Comparative Asian Politics: PR: PCL 201 and PCL 303 or C.I. Selected Asian political systems will be examined in terms of the interaction between political institutions and processes and social, cultural and economic structures.

PCL 348 Qtr. Hrs. - 4 (4,0)
Politics of Mexico, Central America, and the Caribbean: Survey of politics and governments of the area. Influence of cultural, social and economic factors in each country's political development are considered.

PCL 349 Qtr. Hrs. - 4 (4,0)
Politics of South America: PR: PCL 348 or C.I. Survey of politics and governments of the continent with emphasis on Argentina, Brazil, and Chile. General conclusions about Latin American politics will be drawn.

PCL 350 Qtr. Hrs. - 4 (4,0)
Introduction to Public Administration: PR: PCL 201 and PCL 303 or C.I. Analysis of administrative theories and the process of implementing public policies in a democratic society.

PCL 405 Qtr. Hrs. - 4 (4,0)
Political Theory: PR: PCL 201 and PCL 303 or C.I. Examination of various normative and empirical approaches to the study of political science, stressing contemporary developments in the field.

PCL 406 Qtr. Hrs. - 4 (4,0)
Contemporary Democratic Theory: Study of democratic theories emphasizing elitist theories, participatory democracy, citizen participation and the relevance of empirical research to democratic theory.

PCL 411 Qtr. Hrs. - 4 (4,0)
Public Policy Administration: Problem of values, interests, and objectives and their impact on execution of public programs, stressing the relationship between policies and administration.

PCL 413 Qtr. Hrs. - 4 (4,0)
Metropolitan Politics: PR: PCL 203 and PCL 303 or C.I. Analysis of political patterns, processes and issues in American communities.

PCL 414 Qtr. Hrs. - 4 (4,0)
Metropolitan Administration I: PR: PCL 350 or PCL 413 or C.I. Study of the formal and informal socio-political structures that govern urban areas; emerging patterns of government, and management practices in urban and suburban settings.

PCL 416 Qtr. Hrs. - 12-15 (0,12-15)
Public Administration Internship: PR: C.I. Internship in municipal, county, state or federal government, including assignments in such fields as personnel, planning, budget and fiscal, procurement and public safety.

PCL 417 Qtr. Hrs. - 4 (4,0)
Policy Problems of Metropolitan Areas: PR: 4 hours of political science or C.I. A course designed to provide an in-depth analysis of two or three basic policy areas; for example, transportation, education, welfare, crime, etc.

PCL 418 Qtr. Hrs. - 4 (4,0)
The Politics of Planning for Urban Communities: PR: PCL 413 or C.I. An examination of social, political, and economic factors influencing the urban planning process at local, state, and national levels.

PCL 420 Qtr. Hrs. - 4 (4,0)
Contemporary International Politics of Asia: Examination of the role of Asia in international politics and the foreign policies of major and secondary powers as they relate to trends in Asia.

PCL 421 Qtr. Hrs. - 4 (4,0)
International Politics of the Middle East: The external politics of the Middle East from a regional-global perspective with particular attention to the region's impact upon the relations of major powers.

PCL 422 Qtr. Hrs. - 4 (4,0)
Inter-American Politics and Organizations: Examination of relations among American Republics. Special attention given the roles of the United States, the Organization of American States, and trade and aid arrangements.

PCL 424 Qtr. Hrs. - 4 (4,0)
Political Sociology: Sociological analysis of political and para-political groups; socio-economic variables of voting behavior; power elites; societies and systems of government.

PCL 425 Qtr. Hrs. - 4 (4,0)
Political Party Behavior: In depth analysis of selected topics in political party behavior including: changes in Southern politics; urban parties in transition; political campaigns; the changing electorate.

PCL 427 Qtr. Hrs. - 4 (4,0)
American Foreign Policy: PR: PCL 201 and PCL 303 or C.I. An analysis of the traditions and development of American foreign policy with major emphasis on the role and policies of the United States in the contemporary world.

PCL 428 Qtr. Hrs. - 4 (4,0)
American Defense Policy: Study of policy evolution since World War II including consideration of the social and political costs involved and means of control.

PCL 430 Qtr. Hrs. - 4 (4,0)
International Organizations: PR: PCL 201 and PCL 303 or C.I. The nature and growth of international agencies of cooperation. Attention focused on the problems and development of functional, regional, and universal organizations.

PCL 433 Qtr. Hrs. - 4 (4,0)
International Law: PR: PCL 201 and PCL 303 or C.I. An introduction to the nature of evolution, and sources of international law and its role in interstate relations.

PCL 435 Qtr. Hrs. - 4 (4,0)
Coercion in International Politics: PR: PCL 201 and PCL 303 or C.I. An examination of the role of coercive techniques among states in a nuclear age including theories of nuclear strategy and deterrence.

PCL 440 Qtr. Hrs. - 4 (4,0)
Comparative Public Administration I: PR: PCL 303, 203 203 and PCL 303 or C.I. An analysis of administrative structures and processes of selected countries, including an evaluation of the influence of economic, social and political environment on bureaucratic functions and the role of the executive.

PCL 441 Qtr. Hrs. - 4 (4,0)
Comparative Public Administration II: PR: PCL 201 and PCL 303 or C.I. A case study approach to the problems of administration in diverse political environments stressing patterns of organization, personnel systems, field services and administrative style.

PCL 442 Qtr. Hrs. - 4 (4,0)
Government and Politics of Great Britain: PR: PCL 341 or C.I. A survey of British government, society, and institutions, with emphasis on the growth and development of parliamentary democracy.

PCL 443 Qtr. Hrs. - 4 (4,0)
Government and Politics of the Soviet Union: PR: PCL 341 or C.I. Examination of the origins, institutions, and functioning of the Soviet political system, including the role and characteristics of the communist party of the Soviet Union.

PCL 444 Qtr. Hrs. - 4 (4,0)
Government and Politics of China: Examination of the origins, institutions, and functioning of the Chinese political system, including the role and characteristics of the communist party of China.

PCL 447 Qtr. Hrs. - 4 (4,0)
Comparative Political Culture and Socialization: PR: PCL 201 and PCL 303 or C.I. Comparative analysis of the quality and function of political cultures and of recruitment and socialization processes. Analysis and comparison of developed and developing political systems.

PCL 450 Qtr. Hrs. - 4 (4,0)
American Public Policy: PR: PCL 201 and PCL 303 or C.I. The American policy-making process with a focus upon contemporary problems including the malapportionment of societal power and social conflict.

PCL 461 Qtr. Hrs. - 4 (4,0)
Political Philosophy I: PR: PCL 201 and PCL 303 or C.I. Study of the development of political and social ideas in Western thought from early Greece to the Renaissance.

PCL 462 Qtr. Hrs. - 4 (4,0)
Political Philosophy II: PR: PCL 201 and PCL 303 or C.I. Renaissance to the 19th Century.

PCL 463 Qtr. Hrs. - 4 (4,0)
Political Philosophy III: PR: PCL 201 and PCL 303 or C.I. Study of contemporary Western political and social thought in the 19th and 20th Centuries.

PCL 471 Qtr. Hrs. - 4 (4,0)
American Constitutional Law: PR: PCL 201 and PCL 303 or C.I. The impact of judicial decision-making upon the growth of American political institutions and processes.

PCL 473 Qtr. Hrs. - 4 (4,0)
American Constitutional Law: PR: PCL 201 and PCL 303 or C.I. The role of the judiciary in the focusing and refinement of individual rights and civil liberties in American society.

PCL 475 Qtr. Hrs. - 4 (4,0)
Judicial Behavior: Study of Judicial Behavior emphasizing the role of courts as a bureaucratic structure. Consideration will be given to comparative judicial systems.

PCL 510 Qtr. Hrs. - 4 (4,0)
Administrative Problems of the Metropolitan Community: PR: PCL 201, 350 or C.I. Senior or graduate standing. This course focuses on the processes of policy formulation and execution in the metropolitan community, including governmental restructure and area-wide policy formulation and implementation.

PCL 550 Qtr. Hrs. - 4 (4,0)
Contemporary American Problems: PR: PCL 201, 303, 450 or C.I. Senior or graduate standing. A public policy analysis of current problems encountered within the American political system and an examination of policy alternatives.

PCL 600 Qtr. Hrs. - 4 (4,0)
Public Policy and Political Analysis: PR: C.I. An analysis of governmental action and models useful in policy analysis, stressing the pressures and procedures in decision making in a dynamic federal system.

PCL 601 Qtr. Hrs. - 4 (4,0)
Public Policy and Political Research: PR: C.I. Approaches to problem solving in policy and political research, empahsizing the formulation of research strategies, sources of data, and data analysis.

PCL 603 Qtr. Hrs. - 4 (4,0)
Statistical Models for Policy Analysis: PR: PCL 601 and C.I. Applications and analysis of problems in the use of statistical data. Emphasis on methods of data collection and analysis.

PCL 605 Qtr. Hrs. - 4 (4,0)
Bureaucracy and Public Policy: PR: C.I. A critical examination of the bureaucracy and the development and impact of bureaucratic behavior and structure upon public administration.

PCL 611 Qtr. Hrs. - 4 (4,0)
Planning and Organization for Economic and Social Development: PR: C.I. The purpose and use of economic and social planning, examining theories of development, regional analysis, methods and administration of planning, and evaluation of plan performance.

PCL 612 Qtr. Hrs. - 4 (4,0)
Choice Theory: PR: C.I. Analysis of rational choice theories, game theoretic models, incremental decision making, with applications to problems of strategy and politics.

PCL 614 Qtr. Hrs. - 4 (4,0)
The Environment of Policy Making: PR: C.I. Consideration of the impact of the intra-systemic and extra-systemic environment upon the decision making process.

PCL 620 Qtr. Hrs. - 4 (4,0)
Public Opinion and Policy Formation: PR: C.I. A substantive and theoretical approach to understanding relationships between public opinion and public policy, including opinion/policy linkage models as well as opinion measurement.

PCL 630 Qtr. Hrs. - 4 (4,0)
Policy Analysis and Administration: PR: C.I. Progarm analysis and organization structure as policy tools, examining the implementation of differential policy and the administrator as policy maker and change agent.

PCL 633 Qtr. Hrs. - 4 (4,0)
Budgeting as a Policy and Program Instrument: PR: C.I. Budgets as planning/programming documents, stressing the relationships of policy and budgetary decisions, problems in grantsmanship and revenue decision making, program budgeting, PPBS, and incrementalism.

PCL 636 Qtr. Hrs. - 4 (4,0)
Labor-Management Relations in the Public Sector: PR: C.I. A broad perspective of management-employee relations in the public sector including grievance procedures, fact finding, collective bargaining, mediation and arbitration.

PCL 670 Qtr. Hrs. - 4 (4,0)
Issues in Urban Public Policy: PR: C.I. Study of characteristic policy issues which arise in urban political systems, and the consideration of various public responses to those issues.

PCL 672 Qtr. Hrs. - 4 (4,0)
Issues in State Public Policy: PR: C.I. Analysis of selected aspects of policy issures occurring in the American states with attention given to both single state and comparative studies.

PCL 673 Qtr. Hrs. -4 (4,0)
Issues in National Public Policy: PR: C.I. Study of the establishment and evaluation of selected national issues and priorities, means of implementation, and impacts of government programs.

PCL 675 Qtr. Hrs. - 4 (4,0)
Issues in International Public Policy: PR: C.I. Analysis of domestic and foreign inputs influencing foreign policy formulation and execution, with extended analysis devoted to executive structures and decision making behavior.

PCL 676 Qtr. Hrs. - 4 (4,0)
Issues in Economic Public Policy: Examination from the perspectives of organization and politics of selected fiscal and monetary policy issues; emphasis on the limitations economic factors place upon policy making.

PCL 677 Qtr. Hrs. - 4 (4,0)
Issues in Public Administration: PR: C.I. Analysis of both substantive and theoretical issues confronting the broad spectrum of contemporary public administration; consideration of the "new public administration" movement.

PSYCHOLOGY

PSY 201 Qtr. Hrs. - 3 (3,0)
General Psychology: The basic principles, theories, and methods of contemporary psychology.

PSY 202 Qtr. Hrs. - 3 (3,0)
General Psychology: PR: PSY 201. A continuation of PSY 201.

PSY 300 Qtr. Hrs. - 3 (3,0)
Applied Psychology: Applications of principles of psychology to personal adjustment, industry, and education.

PSY 301 Qtr. Hrs. - 4 (3,2)
Basic Learning Processes: PR: PSY 201 and PSY 202. A survey of theories and research findings from basic laboratory investigation of learning phenomena. Lec.-Lab.

PSY 302 Qtr. Hrs. - 4 (3,2)
Complex Human Learning: PR: PSY 201 and PSY 202. Selected topics from theories and research on complex human learning and problem solving. Lec-Lab.

PSY 303 Qtr. Hrs. - 4 (4,0)
Physiological Psychology: ~~PR: PSY 201 and PSY 202.~~ Physiological bases of behavior.

PSY 304 Qtr. Hrs. - 4 (3,1)
Perception: PR: PSY 201 and PSY 202. Consideration of physical and psychological variables in perceptual phenomena. Lec-Lab.

PSY 305 Qtr. Hrs. - 4 (4,0)
Psychological Measurement: PR: PSY 201, PSY 202, and STAT 201. Theory of test construction and consideration of selected measures of psychological characteristics.

PSY 306 Qtr. Hrs. - 4 (4,0)
Psychology of Adjustment: Psychological principles of adjustment; application of psychology to problems in living.

PSY 307 Qtr. Hrs. - 4 (4,0)
Motivation: PR: PSY 201 and PSY 202. Psychological and physiological aspects of human motivation.

PSY 308 Qtr. Hrs. - 4 (4,0)
Social Psychology: PR: PSY 201 and PSY 202. Effects of social situations and social variables on the behavior of individuals.

PSY 309 Qtr. Hrs. - 4 (4,0)
Personality Theory: PR: PSY 201 and PSY 202. A survey of theory and research on the development of personality characteristics. Lec-Lab.

PSY 310 Qtr. Hrs. - 4 (4,0)
Abnormal Psychology: PR: PSY 201 and PSY 202. Classification, causation, and treatment of deviant patterns of behavior.

PSY 312 Qtr. Hrs. - 4 (4,0)
Clinical Psychology: PR: PSY 309 and PSY 310. Consideration of psychodiagnostics, behavorial modification techniques and clinical research. Lec-Lab.

PSY 313 Qtr. Hrs. - 4 (4,0)
Developmental Psychology: PR: PSY 201 and PSY 202. The effects of genetic, psychological, maturational and social factors on behavior at various stages of development.

PSY 314 Qtr. Hrs. - 4 (4,0)
Industrial Psychology: PR: PSY 201, PSY 202, and STAT 201. Psychological principles of employee selection, training, and morale.

PSY 315 Qtr. Hrs. - 4 (4,0)
Drugs and Behavior: PR: PSY 201. Effects of certain drugs upon the nervous system, behavior, and society. Causes of drug abuse and the impact on mental health.

PSY 321 Qtr. Hrs. - 4 (4,0)
Principles of Behavior Modification: PR: PSY 301. An examination of the control of behavior through applications of principles and theories of learning. Examples are drawn from clinical and social psychology and from child rearing.

PSY 322 Qtr. Hrs. - 4 (4,0)
Clinical Psychology Research Practicum: PR: PSY 301, PSY 310, and PSY 311. Research and practicum experience in mental health related facilities located in the immediately surrounding area.

PSY 323 Qtr. Hrs. - 4 (4,0)
Comparative Psychology: PR: PSY 201 and PSY 202. A study of comparative behaviors of lower animals.

PSY 333 Qtr. Hrs. - 4 (4,0)
Development of Language and Conceptual Behavior: PR: PSY 301. Normal ontogeny of language and conceptual behavior from infancy to adulthood; disorders of linguistic and conceptual development and their remediation; key theoretical interpretations.

PSY 340 Qtr. Hrs. - 3 (3,0)
Environmental Psychology: PR: PSY 201, PSY 202, and STAT 201. An investigation of theory and research relevant to the relationship between the physical environment and the behavior of man.

PSY 343 Qtr. Hrs. - 4 (4,0)
Educational Psychology: PR: PSY 201 and PSY 202. Application of psychological principles and research methods to classroom behavior and learning.

PSY 353 Qtr. Hrs. - 4 (4,0)
The Psychology of Racial Prejudice: Examination of literature relating to prejudice toward ethnic groups; effects of facism on individuals, development and maintenance of prejudice, and possible ways to reduce prejudice.

PSY 390 Qtr. Hrs. - 3 (0,3)
Undergraduate Field Work: Placement in a community agency for supervised experience in applications of psychology to community problems.

PSY 401 Qtr. Hrs. - 2 (2,0)
Senior Research Proposal: PR: STAT 401 and Senior standing. Study in depth of bibliography and methods of psychological research. Each student will write, and have approved, a proposal for an original piece of research.

PSY 403 Qtr. Hrs. - 5 (3,2)
Introduction to Neuropsychology: PR: PSY 303. Study of brain function with particular emphasis on human behavior. Lec-Lab.

PSY 405 Qtr. Hrs. - 4 (4,0)
History and Systems of Psychology: PR: PSY 301 and PSY 309. Historical development of psychology with emphasis on classical theoretical positions.

PSY 411 Qtr. Hrs. - 4 (4,0)
Statistical Methods in Psychology: PR: One course in statistics. Standard scores, confidence intervals, sampling distributions, hypothesis testing, correlation and regression as applied to research in psychology.

PSY 415 Qtr. Hrs. - 5 (2,3)
Individual Intelligence Testing: PR: PSY 305. A consideration of the nature of intelligence and its measurement. Supervised training in Stanford-Binet and Wechsler testing. Lec-Lab.

PSY 606 Qtr. Hrs. - 4 (4,0)
Psychological Testing II: PR: Graduate admission and C.I. An examination of the most commonly used instruments in psychological testing and a critical evaluation of their potential utility.

PSY 607 Qtr. Hrs. 4 (4,0)
Human Motivation: PR: Graduate admission and C.I. Survey of the area of industrial motivation with emphasis on empirical findings.

PSY 615 Qtr. Hrs. - 4 (0,4)
Counseling Practicum: PR: Graduate admission and C.I. Application of counseling techniques in a supervised setting.

PSY 640 Qtr. Hrs. - 4 (4,0)
Consumer Psychology: PR: Graduate admission and C.I. Application of psychology to consumer behavior. Survey of research in product selection, markets, and advertising.

PSY 641 Qtr. Hrs. - 4 (4,0)
Organizational Psychology: PR: Graduate admission and C.I. Survey of present theories in Organizational Psychology. Application of psychological research to organizational functioning.

PSY 650 Qtr. Hrs. - 4 (4,0)
Job Analysis and Personnel Selection: PR: Graduate admission and C.I. Research in and application of job evaluation methods and selection models.

PSY 651 Qtr. Hrs. - 4 (4,0)
Training and Performance Appraisal: PR: Graduate admission and C.I. Survey of problems of industrial training and performance appraisal. Analysis of relevant research in problems of evaluation of training effectiveness.

PSY 654 Qtr. Hrs. - 2 (2,0)
Psychology Practicum: PR: Graduate admission and C.I. Supervised practice in assessment and intervention techniques. (May be repeated for credit.)

PSY 655 Qtr. Hrs. - 4-12
Community Psychology Internship: PR: Graduate admission, 2nd year status and C.I. Supervised placement in community setting. (May be repeated for credit.)

PSY 656 Qtr. Hrs. - 4-12
School Psychology Internship: PR: Graduate admission, 2nd year status and C.I. Supervised placement in school setting.

PSY 660 Qtr. Hrs. - 4 (0,4)
Industrial Psychology Practicum I: PR: Graduate admission and C.I. Supervised research in industry.

PSY 661 Qtr. Hrs. - 4 (0,4)
Industrial Psychology Practicum II: PR: Graduate admission and C.I. Supervised research in industry.

PSY 662 Qtr. Hrs. - 4 (0,4)
Industrial Psychology Practicum III: PR: Graduate admission and C.I. Supervised research in industry.

PSY 667 Qtr. Hrs. - 4 (4,0)
Problems in Correctional Psychology: PR: Graduate admission and C.I. An investigation of some of the major problems facing psychologists working in correctional settings. May be repeated for credit.

PSY 668 Qtr. Hrs. - 4 (4,0)
Problems in Mental Health: PR: Graduate admission and C.I. An investigation of some of the major problems facing psychologists working in Mental Health clinics. May be repeated for credit.

PSY 669 Qtr. Hrs. - 4 (4,0)
Problems in School Psychology: PR: Graduate admission and C.I. An investigation of some of the major problems facing psychologists working in school systems. May be repeated for credit.

PSY 670 Qtr. Hrs. - 4 (4,0)
Teaching and Training Evaluation: PR: Graduate admission and C.I. Evaluation of effective teaching methods and practicum experience.

PSY 671 Qtr. Hrs. - 4 (4,0)
Individual Intelligence Testing: PR: Graduate admission, PSY 683 and C.I. A survey of commonly used individual tests used to measure intelligence of both children and adults.

PSY 673 Qtr. Hrs. - 4 (4,0)
Mental Retardation: PR: Graduate admission, PSY 683, PSY 684, and C.I. Theory, research and remedial techniques dealing with mental retardation.

PSY 675 Qtr. Hrs. - 4 (4,0)
Implementation and Evaluation: PR: Graduate admission and C.I. Strategies and procedures for evaluating programs in community and school settings.

PSY 676 Qtr. Hrs. - 4 (4,0)
Clinical Psychopharmocology: PR: Graduate admission, PSY 673 and C.I. Physiological and clinical effects of various psychomimetic and psychoactive drugs.

PSY 677 Qtr. Hrs. - 4 (4,0)
Learning Disabilities: PR: Graduate admission and C.I. Theory, research and remedial techniques dealing with learning disabilities and other factors interfering with learning such as motivation, language disorders and perceptual-motor deficits.

PSY 680 Qtr. Hrs. - 4 (4,0)
Personality Testing: PR: Graduate admission, PSY 683, PSY 671 and C.I. Survey of commonly used individual and group personality techniques.

PSY 681 Qtr. Hrs. - 4 (4,0)
Psycho-educational Diagnosis: PR: Graduate admission and C.I. Administration and interpretation of psychoeducational tests. Emphasis on evaluation of exceptional children.

PSY 683 Qtr. Hrs. - 4 (4,0)
Foundations of Psychology I: PR: Graduate admission and C.I. An intensive survey in the areas of testing, learning, and motivation stressing recent research.

PSY 684 Qtr. Hrs. - 4 (4,0)
Foundations of Psychology II: PR: Graduate admission and C.I. An intensive survey in the areas of developmental, personality, and social psychology stressing recent research.

PSY 686 Qtr. Hrs. - 4 (4,0)
Clinical Intervention I: PR: Graduate admission and C.I. Various theories of counseling and their evaluated efficiency, including the problems of research in counseling techniques.

PSY 687 Qtr. Hrs. - 4 (4,0)
Clinical Intervention II: PR: Graduate admission, PSY 683 and C.I. Introduction to the principles and procedures of behavior modification as a clinical intervention technique. Je.

PSY 688 Qtr. Hrs. - 4 (4,0)
Clinical Intervention III: PR: Graduate admission, PSY 684 and C.I. Principles and procedures of the various therapeutic techniques excluding client-centered and behavior modification models.

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QUANTITATIVE BUSINESS ANALYSIS

QBA 312 Qtr. Hrs. - 4 (4,0)
Quantitative Analysis I: PR: MATH 320. Mathematical models and techniques used in the formulation, solution, and analysis of business problems. Linear, non-linear and dynamic programming, network, decision tree analysis; queuing, inventory, and decision theory. Computer applications.

QBA 313 Qtr. Hrs. - 4 (4,0)
Quantitative Analysis II: PR: QBA 312. Continuation of QBA 312.

QBA 450 Qtr. Hrs. - 4 (4,0)
Business Simulation: PR: MATH 320 and COMP 310. An introduction to simulating various aspects of the business enterprise. Topics include the simulation modeling process, applicable simulation languages, and model formulation, analysis, and validation.

QBA 451 Qtr. Hrs. - 4 (4,0)
Quantitative Applications to Business Problems: PR: QBA 313 or C.I. Applications of quantitative analysis to complex business problems. Emphasis is on analyzing specific problem situations and deciding on appropriate quantitative techniques to be applied.

R

RADIO/TELEVISION

RTV 337 Qtr. Hrs. - 4 (1,3)
Broadcast Techniques: Introduction to the radio and television studio. Utilization of studio operating techniques and equipment (consoles, recorders, cameras, etc.) for use in educational and commercial broadcasting.

RTV 340 Qtr. Hrs. - 4 (4,0)
Audio Production: PR: RTV 337 or C.I. The production of music (live and recorded), talk, interview, discussion, sports, and documentary including performance (talent and announcing) and direction.

RTV 341 Qtr. Hrs. - 4 (4,0)
Television Production: PR: RTV 337 or C.I. Emphasis on the coordination of talent, cameras, visuals, audio and lighting with the dramatic values of the presentation.

RTV 342 Qtr. Hrs. - 4 (4,0)
Broadcast Journalism I: PR: COM 319 or C.I. Historical, legal, and quasi-legal influences on broadcast news; introduction to news sources, writing and interviewing techniques for radio-television news.

RTV 343 Qtr. Hrs. - 4 (4,0)
Television Talent Techniques: A study of communication problems on camera and microphone. Development of performance skills in announcing, interviewing, narrating, and reporting.

RTV 344 Qtr. Hrs. - 4 (4,0)
Broadcast Continuity and Programming I: Practice in the preparation of written commercial copy for radio and television. Examination of program practices and traffic systems.

RTV 345 Qtr. Hrs. - 4 (4,0)
Films for Television: Principles and practices of 8mm and 16mm film usage within the television industry.

RTV 347 Qtr. Hrs. - 4 (4,0)
Television Scene Design: PR: RTV 337 or C.I. Study, application, and creative utilization of staging, lighting, graphics, special effects, costuming, and make-up for television production.

RTV 355 Qtr. Hrs. - 4 (4,0)
Foundations of Broadcasting: Nature of the media, the mechanics of operation, history, economics, programming, and internal and external control.

RTV 441 Qtr. Hrs. - 4 (4,0)
Television Directing: PR: RTV 341. The planning, preparation and directing of programs with emphasis on dramatic values of composition, movement, position, action, timing, pacing, climax, ascendant and descendant values; intergration of the parts to the whole.

RTV 444 Qtr. Hrs. - 4 (4,0)
Broadcast Continuity and Programming II: PR: RTV 344 or C.I. Preparation of documentaries and dramatic writing for television and radio.

RTV 445 Qtr. Hrs. - 4 (1,3)
Television Film Production: PR: C.I. Planning and preparation of filmed documentaries, public service and commercial productions. (Laboratory hours to be arranged.)

RTV 446 Qtr. Hrs. - 4 (4,0)
Radio, Television and Society: A study of the impact of electronic media upon the habits, customs and thinking of our times. Considerations of internal media problems.

RTV 447 Qtr. Hrs. - 4 (4,0)
Television Film Documentary: PR: C.I. Historical developments, styles, and production techniques of the television film documentary.

RTV 448 Qtr. Hrs. - 4 (4,0)
Broadcast Regulations: PR: RTV 355 or RTV 342. Federal, state, local and self-regulator agencies and practices which govern electronic media.

RTV 450 Qtr. Hrs. - 4 (4,0)
Broadcast Journalism II: PR: RTV 342. Principles and practice of news preparation for electronic media.

RTV 451 Qtr. Hrs. - 3 (3,0)
Radio-Television Advertising: PR: COM 434 or C.I. Radio and television as advertising media; advertisers' demands and budget; appropriate programs for the sponsors' needs; writing of commercial continuity.

RTV 452 Qtr. Hrs. - 4 (4,0)
Broadcast Criticism: Evaluation and criticism of past and present radio and television programs, policies, and critics. Concentration on the problem of criteria development.

RTV 453 Qtr. Hrs. - 4 (4,0)
Educational Television: A study of radio and television in public education. Empahsis on the development and status of public broadcasting.

RTV 454 Qtr. Hrs. - 4 (4,0)
Instructional Broadcasting: Learning theory applied to the creation, production, and dissemination of lessons via electronic media. Introduction to and practicum in radio and television studios as well as lesson presentation.

RTV 455 Qtr. Hrs. - 4 (4,0)
International Broadcasting: Comparative analysis of national broadcast systems. World broadcasting as a social, political and economic force.

RTV 458 Qtr. Hrs. - 4 (4,0)
Broadcast Management: PR: RTV 448. Consideration of broadcast management problems in station operations at the local, regional, and national levels.

RELIGION

REL 300 Qtr. Hrs. - 4 (4,0)
The Hebrew and Christian Heritage: An examination of the Old and New Testaments as religious documents; a study of their emergence in the socio-political context of the Ancient Near East.

REL 315 Qtr. Hrs. - 4 (4,0)
Religions of China and Japan: A study of basic concepts in Shinto, Taoism, Confucianism, Buddhism, and Zen.

REL 317 Qtr. Hrs. - 4 (4,0)
Hinduism: A study of Hindu religious ideas and scriptures; the Vedas, the Upanishads, the Bhagavat Gita, and later works.

REL 318 Qtr. Hrs. - 4 (4,0)
Islam: An inquiry into the foundations and development of Islamic thought from earliest times to modern in various parts of the world.

REL 319 Qtr. Hrs. - 4 (4,0)
Ancient Near Eastern Religions: An investigation of the principal religions of the ancient Near East with special emphasis on Mesopotamian, Canaanite, and Egyptian religions.

REL 321 Qtr. Hrs. - 4 (4,0)
Religion in America: The effect of Puritan, Quaker, Anglican, and Catholic traditions on various regions; the phenomenon of evangelism; the rise of new sects such as Mormonism.

REL 401 Qtr. Hrs. - 4 (4,0)
Comparative Religion: An analysis of the nature of religious experience in several of the world's major religions, showing their similarities and differences in thought, action, and fellowship.

REL 441 Qtr. Hrs. - 4 (4,0)
Modern Theology: Explores the revolution in religious thought prompted by Kierkegaard, Tillich, Barth, Niebuhr, and Bonhoeffer, and the secular trends suggested by Nietzsche, Altizer, Cox, and Hamilton.

REL 471 Qtr. Hrs. - 4 (4,0)
Mythology: An examination and interpretation of myths dealing with gods, divine heroes, and sacred events.

REL 473 Qtr. Hrs. - 4 (4,0)
The Religious Quest: A study of major religious statements from the desert Fathers to Kafka and Kazantazkis, and of the human and cultural circumstances from which they emerged.

REL 477 Qtr. Hrs. - 4 (4,0)
Mysticism: The modes and aims of the mystic, both Eastern and Western, as seen in art, music, and literature.

RESPIRATORY THERAPY

RTH 301 Qtr. Hrs. - 2 (0,20)
Clinical Practice I: PR: C.I. Basic equipment and patient care. IPPB Therapy. Cleaning, sterilization and maintenance procedures. Suction techniques.

RTH 302 Qtr. Hrs. - 2 (0,20)
Clinical Practice II: PR: C.I. Patient care with advanced respiratory equipment. Tracheostomy care. Advanced suction techniques and introduction to cardiopulmonary resuscitation.

RTH 330 Qtr. Hrs. - 3 (3,0)
Cardiopulmonary Resuscitation: PR: C.I. Resuscitative procedures in respiratory and cardiac emergencies. Airway maintenance. Defibrillation and post-resuscitative care. Drowning, underwater, aviation, and space physiology.

RTH 331 Qtr. Hrs. - 1 (0,3)
Cardiopulmonary Resuscitation Laboratory: CR: RTH 330. Adult intubation and available airways. Defibrillation practice.

RTH 340 Qtr. Hrs. - 3 (3,0)
Introduction to Pharmacology: Regulatory agencies and the regulations concerning the use of drugs. Review of pharmacological mathematics. Drug absorption and distribution in the human body.

RTH 350 Qtr. Hrs. - 3 (3,0)
Introduction to Respiratory Equipment: Fundamental functions of basic inhalation therapy equipment. Systems of oxygen storage. Safety precautions. Preparation for clinical practice.

RTH 351 Qtr. Hrs. - 1 (0,3)
Respiratory Equipment Laboratory: CR: RTH 350. Procedures in cleaning, sterilizing, maintenance, and repair of equipment.

RTH 352 Qtr. Hrs. - 3 (3,0)
Respiratory Equipment Function: PR: RTH 350. Function of advanced respiratory equipment. Arterial blood gas equipment. Prolonged mechanical ventilation. Bedside respiratory volumetric monitoring. Evaluation prior to and during weaning from respirator.

RTH 353 Qtr. Hrs. - 1 (0,3)
Respiratory Equipment Function Laboratory: CR: RTH 352. Care and sterilization of respirators. Calibration of blood gas analyzers. Care and standardization of bedside volumetric equipment.

RTH 370 Qtr. Hrs. - 3 (3,0)
Pulmonary Physiology: PR: CHEM 113 and PHYS 380. Normal ventilation of respiration. Response to gases and ions. Lung reflexes. Ventilatory and mechanical factors. Pulmonary circulation. Gas diffusion and transport. Manual respiratory adjustments.

RTH 371 Qtr. Hrs. - 1 (0,3)
Pulmonary Physiology Laboratory: CR: RTH 370. Experiments in ventilation mechanics, diffusion, circulation, and gas transport.

RTH 380 Qtr. Hrs. - 3 (3,0)
Respiratory Pathology: PR: ZOOL 324. Cellular pathology with emphasis on pathology of respiratory and cardiovascular systems.

RTH 381 Qtr. Hrs. - 1 (0,3)
Respiratory Pathology Laboratory: CR: RTH 380. Macro—and microscopic identification of respiratory diseases. Gross pathology.

RTH 401 Qtr. Hrs. - 2 (0,20)
Clinical Practice III: PR: C.I. Advanced cardiopulmonary resuscitation. Patient care with advanced cardiopulmonary equipment.

RTH 402 Qtr. Hrs. - 2 (0,20)
Clinical Practice IV: PR: C.I. Pulmonary functions studies. Care of patients with medically treated diseases. Exposure to the functional role of the department administrator.

RTH 403 Qtr. Hrs. - 2 (0,20)
Clinical Practice V: PR: C.I. Pediatrics. Pulmonary rehabilitation. Advanced pulmonary function testing. Application of diagnostic techniques in cardiopulmonary diseases and surgical techniques in open-heart, thoracic and general surgery.

RTH 410 Qtr. Hrs. - 2 (1,2)
Pulmonary Rehabilitation: PR: C.I. The motor unit, exercise and fatigue. Therapeutic exercise, exercise in cardiopulmonary disease. Postural drainage, and vibration techniques.

RTH 420 Qtr. Hrs. - 3 (3,0)
Respiratory Pediatrics PR: C.I. Lung development, circulation, and respiratory regulation in fetus and newborn. Pulmonary function in congenital anomalies, infant infections, and hyaline membrane disease. New born resuscitation. Childhood respiratory diseases.

RTH 430 Qtr. Hrs. - 3 (3,0)
Cardiopulmonary Therapy: PR: IT 370. Introduction to diagnostic and surgical techniques in thoracic and general surgery.

RTH 431 Qtr. Hrs. - 1 (0,3)
Cardiopulmonary Therapy Laboratory: CR: RTH 430; PR: C.I. Student participation in cardio-catheterization and extra-corporeal circulation. Operating theatre observation. Extensive patient round and clinical observation.

RTH 440 Qtr. Hrs. - 3 (3,0)
Medical Pharmacology: PR: RTH 340. Use of drugs in cardiovascular diseases. Effects on the nervous system, gastrointestinal tract, and neuroeffectors. Depressants and stimulants. Influence on metabolism and endocrine functions. Anesthetics. Chemotherapy. Poisons and antidotes.

RTH 442 Qtr. Hrs. - 3 (3,0)
Medical Pharmacology: PR: RTH 440. Continuation of RTH 440.

RTH 460 Qtr. Hrs. - 3 (3,0)
Medicine: PR: RTH 370. Disease states treated medically in conjunction with one or more modalities of respiratory therapy.

RTH 461 Qtr. Hrs. - 1 (0,3)
Selected Topics in Respiratory Therapy: CR: RTH 460. Lecture-laboratory course. Includes patient rounds and discussion regarding current trends and techniques in respiratory care.

RTH 462 Qtr. Hrs. - 3 (3,0)
Pulmonary Function Studies: PR: C.I. Detailed procedures and tests to provide objective information for diagnosis of respiratory diseases.

RTH 463 Qtr. Hrs. - 1 (0,3)
Pulmonary Function Laboratory: CR: RTH 462. Testing procedures and experiments in normal and abnormal respiratory functions.

RUSSIAN

RUS 101 Qtr. Hrs. - 4 (4,1)
Elementary Russian Language and Civilization: Designed to initiate the student to the major language skills; listening, speaking, reading, and writing, in addition to an introduction to Russian culture.

RUS 102 Qtr. Hrs. - 4 (4,1)
Elementary Russian Language and Civilization: PR: RUS 101 or equivalent. Continuation of RUS 101.

RUS 103 Qtr. Hrs. - 4 (4,1)
Elementary Russian Language and Civilization: PR: RUS 102 or equivalent. Continuation of RUS 102.

RUS 201 Qtr. Hrs. - 4 (4,1)
Intermediate Russian Language and Civilization: PR: RUS 103 or equivalent. Designed to continue development of language skills at the intermediate level, together with a review of grammar, study of syntax, idiomatic expressions, extensive reading, and further study of Russian culture.

RUS 202 Qtr. Hrs. - 4 (4,1)
Intermediate Russian Language and Civilization: PR: RUS 201 or equivalent. Continuation of RUS 201.

RUS 203 Qtr. Hrs. - 4 (4,1)
Intermediate Russian Language and Civilization: PR: RUS 202 or equivalent. Continuation of RUS 202 with greater emphasis on Russian civilization from the Middle Ages to the present.

RUS 301 Qtr. Hrs. - 4 (4,0)
Russian Conversation: PR: RUS 203 or equivalent. Development of skills in conversation and comprehension through practice. This course may be repeated for credit. When repeated, credit will apply to general electives only.

RUS 303 Qtr. Hrs. - 4 (4,0)
Russian Composition: PR: RUS 203 or equivalent. Development of skills in composition. This course may be repeated for credit. When repeated, credit will apply to general electives only.

SPE 362 Qtr. Hrs. - 4 (4,0)
Platform Speaking: PR: SPE 101 or C.I. Advanced training in selecting and organizing materials for various types of speeches. Practice in thinking and speaking before audiences; contemporary speeches as examples.

SPE 364 Qtr. Hrs. - 5 (5,2)
Physiological Bases of Speech and Hearing: An introduction to the anatomical, physiological, and physical elements underlying the communication process.

SPE 365 Qtr. Hrs. - 2 (2,0)
Parliamentary Procedure: Principles and rules governing participation and leadership in the conduct of formal business meetings.

SPE 366 Qtr. Hrs. - 4 (4,0)
Speech Composition: PR: SPE 101 or C.I. Study and practice in the preparation and delivery of speeches from manuscripts with emphasis on the development of oral style.

SPE 371 Qtr. Hrs. - 3 (3,0)
Speech and Human Relations: Introduction to semantics; symbols and meaning and the relationship with human behavior.

SPE 473 Qtr. Hrs. - 3 (3,0)
Directing Extracurricular Speech Activities: Debate, extemporaneous speech and other speech events; selection and training of contestants; interschool and intramural speech activities.

STATISTICS

STAT 201 Qtr. Hrs. - 4 (4,0)
Principles of Statistics: Introduction to statistical concepts in modern society. Basic principles, frequency distributions, measures of location and dispersion, probability, probability distributions, statistical inference.

STAT 301 Qtr. Hrs. - 4 (4,0)
Fundamentals of Probability and Statistics: PR: Four years of high school mathematics or MATH 106 or MATH 110 or

SPA 481
STYLISTICS: PR: SPA 301 or equivilent. An intense study
An examination of the relationship between language and l
and linguistics analysis of literary texts.

applied to the control of quality of manufactured products. (Same as IEMS 332.)

STAT 335 Qtr. Hrs. - 3 (3,0)
Probability and Statistics for Engineers: PR: MATH 323. Axioms of probability; combinatorial and geometrical probability; probability distributions; measures of location and dispersion; sampling and sampling distributions; estimation and tests of hypotheses; engineering applications. (Same as ENGR 371.)

STAT 341 Qtr. Hrs. - 3 (3,0)
Mathematical Statistics I: PR: MATH 323 and a course in statistics. Sample space, probability axioms, distribution functions, sampling distributions, interval estimation, hypothesis testing, multivariate normal, regression and correlation, linear models, analysis of variance, distribution-free methods.

STAT 342 Qtr. Hrs. - 3 (3,0)
Mathematical Statistics II: PR: STAT 341. Continuation of STAT 341.

STAT 343 Qtr. Hrs. - 3 (3,0)
Mathematical Statistics III: PR: STAT 342. Continuation of STAT 342.

STAT 401 Qtr. Hrs. - 4 (4,0)
Statistical Methods I: PR: One course in statistics or graduate standing. Statistics in research; methods of analyzing data; statistical concepts and models; estimation; tests of hypotheses; regression and correlation; analysis of variance and covariance; statistical design.

STAT 402 Qtr. Hrs. - 4 (4,0)
Statistical Methods II: PR: STAT 401. A continuation of STAT 401.

STAT 411 Qtr. Hrs. - 3 (3,0)
Experimental Design: PR: STAT 402. Methods of constructing and analyzing designs for experimental investigations; concepts of blocking, randomization, and replication; confounding in factorial experiments; incomplete block designs.

STAT 415 Qtr. Hrs. - 4 (4,0)
Regression Analysis: PR: MATH 317 and STAT 401. Least squares techniques in multiple regression; matrix methods; general linear model; residual analysis; transformations; orthogonal polynomials; stepwise and stagewise procedures; non-linear estimation.

STAT 421 Qtr. Hrs. - 3 (3,0)
Survey Design: PR: STAT 402. Methods of constructing and analyzing designs for survey investigations; simple random, stratified, multistage, and multiphase sampling designs; questionnaire construction; methods of estimation; techniques of survey investigation.

STAT 447 Qtr. Hrs. - 3 (3,0)
Probability Theory and Applications: PR: MATH 324. Axioms of probability, discrete and continuous random variables, characteristic functions, Markov chains, recurrent events, sequences of random variables, random walk, simple stochastic processes.

STAT 501 Qtr. Hrs. - 3 (3,0)
Statistical Analysis: PR: A course in statistical methods and a course in mathematical statistics. This course relates the ideas of probability and statistics, including distribution theory, to the collection and analysis of data.

STAT 535 Qtr. Hrs. - 3 (3,0)
Probability for Engineers: PR: STAT 335. Engineering application of probability, combinatorial analysis, sample space, events, probability, discrete and continuous random variables, and probability distributions. (Same as IEMS 502.)

STAT 536 Qtr. Hrs. - 3 (3,0)
Statistics for Engineers: PR: STAT 335. Engineering application of statistics, significance tests and confidence intervals, tests of hypotheses, simple and multiple regression and correlation. (Same as IEMS 503.)

STAT 547 Qtr. Hrs. - 3 (3,0)
Applied Probability: PR: A course in mathematical statistics. Axioms of Probability Theory. Discrete random variables and probability distributions; Demoivre-Laplace limit theorem; laws of large numbers; markov chains; empahsis on applications.

Qtr. Hrs. - 3 (3,0)
tistical Methods: PR: STAT 501. The concepts
tionships among several variables and methods of
sting such relationships.

STAT 621 Qtr. Hrs. - 3 (3,0)
Spectral Analysis and Time Series Analysis: PR: STAT 547. Stochastic models for observations taken at discrete or continuous time points; methods of analysis for such data.

STAT 631 Qtr. Hrs. - 3 (3,0)
Biostatistics: PR: STAT 501. Models and methods of analysis for the quantal response in toxicity and morbidity experiments; statistical techniques for use in bioassay, carcinogenesis experiments and sensory tests.

STAT 647 Qtr. Hrs. - 3 (3,0)
Probability and Statistics: PR: STAT 547. Probability and measure theory; distributions of continuous random variables; characteristic functions; sequences and sums of random variables; the central limit problem.

S

SCIENCE

SCI 480 Qtr. Hrs. - 3 (3,0)
Science in Human Affairs: Readings and discussion of major recent articles concerning the interaction of science and scientific thought with the quality of human life.

SCI 481 Qtr. Hrs. 3 (3,0)
Our Chemical Environment: An examination of the role of modern chemical technology in our society — its beneficial and detrimental effects.

SCI 482 Qtr. Hrs. - 3 (3,0)
The Development of Modern Chemistry: A look at man's changing theories of matter, energy, the universe, and himself with emphasis on the scientific accomplishments of the past two centuries.

SCI 483 Qtr. Hrs. - 3 (3,0)
Physics in Society: Physical processes related to development and stability of society. Topics selected from music, art, transportation, thermodynamics, cybernetics. Discussion emphasized, little mathematics required.

SCI 484 Qtr. Hrs. - 3 (3,0)
Biological Nature of Man: Man's behavior, reproduction, development, diversity, heredity, evolution, population control, aggression, and biological needs in contemporary society.

SCI 485 Qtr. Hrs. - 3 (3,0)
Biology and Society: Biological concepts applied to current human problems — food production, pollution, disease, extinction, and disrupted ecosystems.

SCI 486 Qtr. Hrs. -3 (3,0)
History and Future of Health Care: Development and philosophy of health care institutions; purposes of health agencies, organizations and allied health professionals; new trends in health care delivery.

SCI 487 Qtr. Hrs. - 3 (3,0)
Geology of Our National Parks and Monuments: Survey of the unique geologic features preserved in our national park system and discussion of the processes that gave rise to these features.

SOCIAL SCIENCE

SSC 490 Qtr. Hrs. - 2 (2,0)
Senior Seminar: Social Sciences in Human Affairs: An overview of the development, purposes, and functioning of the social sciences in modern society. Primarily intended for senior students. Offered as one of the Advanced Environmental Studies seminars. Not open to students in the College of Social Sciences.

SOCIOLOGY

Introductory Sequence: SOC 201, 202.

Theory and Research Sequence: SOC 304, 306, 307, 499.

Social Psychology Area: SOC 352, 353, 354, 451.

Anthropology Concentration: SOC 310, 311, 314, 315, 316, 402.

Social Welfare Concentration: SOC 340, 341, 342, 343, 412, 498.

Social Organization: SOC 325, 326, 333, 335, 407, 411, 416.

Social Deviance: SOC 331, 345, 346, 348, 350.

SOC 201 Qtr. Hrs. - 4 (4,0)
General Sociology: The basic principles, theories and methods of contemporary sociology.

SOC 202 Qtr. Hrs. - 4 (4,0)
General Sociology: PR: SOC 201. Continuation of SOC 201.

SOC 304 Qtr. Hrs. - 4 (4,0)
The Development of Social Thought: PR: SOC 201. An overview of theories concerning the nature of man as a "social being." The nature of society from the beginnings of the scientific study of man's social life to World War II.

SOC 306 Qtr. Hrs. - 4 (4,0)
Modern Sociological Thought: PR: SOC 201 and SOC 304. A study of major European and American contributors to, and schools of, modern sociology from World War II to the present.

SOC 307 Qtr. Hrs. - 4 (4,0)
The Sociology of Religion: Patterns in religious behavior in various societies with primary emphasis on myth, rite, taboo and festival as social phenomena.

SOC 308 Qtr. Hrs. - 4 (4,0)
Ethnology of North American Indians: A survey of the aboriginal cultures of North America with emphasis on the pre-contact cultural condition.

SOC 309 Qtr. Hrs. - 4 (4,0)
Plains Indians of North America: A study of the social and cultural history of the Indians of the North American High Plains.

SOC 310 Qtr. Hrs. - 4 (4,0)
Physical Anthropology and Archeology: Introductory anthropological survey of physical anthropology and archaeology. Survey of man's place among primates, evolution, genetics, and prehistoric cultural development to the earliest civilizations worldwide.

SOC 311 Qtr. Hrs. - 4 (4,0)
Social Anthropology: Framework and principles of sociocultural organization as exemplified among various cultures and ethnic groups.

SOC 312 Qtr. Hrs. - 4 (4,0)
Old World Prehistory: PR: SOC 310 and SOC 311. Fundamentals of archaeological discipline and research techniques. Surveys prehistoric record of cultural development from earliest times to rise of civilizations in all areas of Old World.

SOC 313 Qtr. Hrs. - 4 (4,0)
New World Prehistory: PR: SOC 310 and SOC 311. Essentials of New World archaeology, methods, and excavations. Surveys space-time framework of Native American Indian cultures and civilization from earliest times to A.D. 1500.

SOC 314 Qtr. Hrs. - 4 (4,0)
Archaelolgical Methods: PR: SOC 310 or 311. A seminar surveying archaeological field and laboratory techniques; i.e., bone preservation, zooarchaeology, ethnobotany, cataloguing, classification, and laboratory analysis.

SOC 315 Qtr. Hrs. - 4 (4,0)
Physical Anthropology: PR: SOC 310 and SOC 311. The study of man as a product of the evolutionary process. Study and analysis of diversity among present human populations.

SOC 316 Qtr. Hrs. - 4 (4,0)
Comparative Social Organization: PR: SOC 310 and SOC 311. Introduction to anthropological viewpoints on role of marriage, family, kin groups, and descent in the study of economic, political and ideological aspects of social organization.

SOC 317 Qtr. Hrs. - 4 (4,0)
Comparative Cultures: PR: soc 310 and SOC 311. People and societies of Africa: A survey of past native African cultures and an ethnographic inquiry into cultural diversity in African tribal societies.

SOC 320 Qtr. Hrs. - 4 (4,0)
Collective Behavior: PR: SOC 201. Analysis of relatively unstructured social situations such as disasters, mobs, crowds, mass hysteria, protests, fads and fashions.

SOC 325 Qtr. Hrs. - 4 (4,0)
Urban Sociology: PR: SOC 201. Historical roots of urbanization. Analysis and impact of community change on social organizations in modern industrial societies.

SOC 326 Qtr. Hrs. - 4 (4,0)
Rural Sociology: PR: SOC 201. Rural American life, its resources, and the problems of changing patterns of rural social structure.

SOC 331 Qtr. Hrs. - 4 (4,0)
Social Problems: Analysis of major social problems such as mental disorders, sexual deviance, racial discrimination, poverty, community disorganization, and violence.

SOC 333 Qtr. Hrs. -4 (4,0)
Industrial Sociology: PR: SOC 201. Application or development of principles of sociology relevant to the industrial mode of production and the industrial way of life.

SOC 335 Qtr. Hrs. - 4 (4,0)
Social Institutions: PR: SOC 201. Social institutions, social differentation, and social control, with emphasis on American and other modern societies.

SOC 336 Qtr. Hrs. - 4 (4,0)
Social Stratification: PR: SOC 201. Study of class, status and power; cultural variations in stratification system; patterns of mobility and change.

SOC 340 Qtr. Hrs. - 4 (4,0)
Social Welfare: A Social Institution: PR: SOC 201. An introduction to social welfare as an institution. The historical and philosophical development of social welfare as related to current social welfare objectives and programs.

SOC 341 Qtr. Hrs. - 4 (4,0)
Social Work: Principles and Methods: PR: SOC 340. A theoretical consideration of the concepts and methods of social work practice and the values, activities and roles of social workers in various practice settings.

SOC 342 Qtr. Hrs. - 4 (4,0)
Government and Social Welfare: PR: SOC 340. The role of federal, state, and local government in social welfare. Laws, policy formulation, administration, and current issues will be examined.

SOC 343 Qtr. Hrs. - 4 (4,0)
The Community and Social Welfare: PR: SOC 340. The community as a social system in meeting human needs. Emphasis on private agencies, including their organization, functions, interrelationships and coordination with governmental agencies.

SOC 344 Qtr. Hrs. - 4 (4,0)
Sociology of Deviant Behavior: PR: SOC 201. An examination of the nature, types and societal reactions to deviant behavior; special emphasis on the process of stigmatization and the emergence of deviant subcultures.

SOC 345 Qtr. Hrs. - 4 (4,0)
Juvenile Delinquency: Types of delinquent behavior found among juveniles; possible causes and ways society attempts to treat the various forms of delinquency.

SOC 346 Qtr. Hrs. - 4 (4,0)
Criminology: PR: SOC 201. Chief causes of anti-social behavior and current methods of prevention and reform. Effects of heredity and environment, prevalence of delinquency and crime, penal institutions.

SOC 347 Qtr. Hrs. - 4 (4,0)
Sociology of Mental Illness: A sociological examination of mental illness as a social problem; legal aspects of mental illness, and the mental health professions.

SOC 348 Qtr. Hrs. - 4 (4,0)
Sociology of Alcoholism: Introduction to the nature of alcoholism and review of its impact on society.

SOC 349 Qtr. Hrs. - 4 (4,0)
Human Growth and Development: PR: SOC 340. Development of an understanding of individual physical, mental and emotional growth from birth to death, recognizing social and cultural influences on the development.

SOC 350 Qtr. Hrs. - 4 (4,0)
Interviewing in Social Work Practice: PR: SOC 340. Examination of interviewing as the primary medium through which social work is practiced with emphasis on the development of methods, skills and techniques.

SOC 352 Qtr. Hrs. - 4 (4,0)
Race and Ethnic Minorities in the United States: Theoretical analysis of the emergence, maintenance and disruption of patterns of racial and ethnic stratification.

SOC 353 Qtr. Hrs. - 4 (4,0)
Culture and Personality: PR: SOC 201. Theories of the variations in personality in relation to culture and group life in tribal and modern societies.

SOC 354 Qtr. Hrs. - 4 (4,0)
Sociology of Adolescence: An examination of the transition to adulthood in various societies with primary emphasis on initiation and the contemporary American problems centering around the "adolescent crisis."

SOC 360 Qtr. Hrs. - 4 (4,0)
Social Change: A Historical and Theoretical Approach: PR: SOC 201. Concerned with the context and essential sources of social development and change.

SOC 362 Qtr. Hrs. - 4 (4,0)
Contemporary Woman and Society: An interpretation of the changing role of woman in contemporary American society.

SOC 380 Qtr. Hrs. - 4 (4,0)
Afro-American Social Problems: A study of contemporary Afro-American social problems in the United States.

SOC 401 Qtr. Hrs. - 4 (4,0)
Individual in Sociology: PR: SOC 201. Study of the relationship between the individual and social groups. Emphasis interaction processes and the resultant impact upon the individual.

SOC 402 Qtr. Hrs. - 4 (4,0)
Method and Theory in Anthropology: PR: SOC 310 and SOC 311. Central methodological and theoretical concerns of anthropology in its emergence as a separate discipline and field of study.

SOC 403 Qtr. Hrs. - 4 (4,0)
Anthropological Linguistics: PR: SOC 310, SOC 311, and ENG 371. Survey of anthropological linguistic field techniques in non-native cultures and application of linguistic theories to study of socio-cultural systems.

SOC 405 Qtr. Hrs. - 4 (4,0)
Medical Sociology: Social organization of medical care: patterns of morbidity and mortality, social epidemiology and effects of disease, utilization of medical services, medical practice, programs and organizations.

SOC 406 Qtr. Hrs. - 4 (4,0)
~~Social Gerontology~~ (Sociology of Aging): PR: SOC 201. An examination of the sociological aspects of aging in America including the needs of the aged and community resources to meet their needs.

SOC 407 Qtr. Hrs. - 4 (4,0)
The Family: PR: SOC 201. The family viewed functionally as a distinct social and cultural complex in the contemporary United States. Topics include: mate selection, marriage, adjustment, parenthood, post marriage.

SOC 408 Qtr. Hrs. - 4 (4,0)
Social Change in Developing Areas: PR: SOC 201 and one course in statistics. A study of growth problems in the emerging nations of Africa and Latin America.

SOC 411 Qtr. Hrs. - 4 (4,0)
Population: Concerned with the study of human population, its distribution, composition and change.

SOC 412 Qtr. Hrs. - 4 (4,0)
Field Experience and Seminar: PR: SOC 340, 341, 342, 343, 349, and 350. Supervised learning experiences in local social agencies relating theory and academic preparation with practice. Eight hours per week plus two hour weekly seminar.

SOC 416 Qtr. Hrs. - 4 (4,0)
Human Ecology: PR: SOC 201. Principles governing the spatial distribution of human populations and activities within an area.

SOC 420 Qtr. Hrs. - 4 (4,0)
Political Sociology: Sociological analysis of political and para-political groups; socio-economic variables of voting behavior; power elites; societies and systems of government.

SOC 433 Qtr. Hrs. - 4 (4,0)
Sociology of Occupations and Professions: An examination of occupations and professions from the sociological perspective. Emphasized are professional and occupational socialization, marginality and choice as well as women and work.

SOC 435 Qtr. Hrs. - 4 (4,0)
Sociology of Education: PR: 201. This course examines the sociological dimensions of the educational institutions including the impact of social structure on learning and the role of education in social change.

SOC 451 Qtr. Hrs. - 4 (4,0)
Contemporary Social Movements: PR: SOC 201. Causes and effects of various social movements in American society compared to large-scale upheavals throughout the West. Considers various theories of explanation.

SOC 452 Qtr. Hrs. - 4 (4,0)
Sociology of Drug Abuse: PR: SOC 201 or C.I. The analysis of the socio-cultural elements of the drug culture. This course will survey problems, impact on society, and possible solutions.

SOC 501 Qtr. Hrs. - 4 (4,0)
Proseminar in Sociology: PR: Six hours of Sociology and graduate level status or C.I. Study of culture, groups, demography, stratification, and culture and personality.

SOC 502 Qtr. Hrs. - 4 (4,0)
Proseminar in Sociology: PR: Six hours of Sociology and graduate level status or C.I. study of social change, institutions, large organizations, and internal behavior.

SPANISH

SPA 101 Qtr. Hrs. - 4 (4,1)
Elementary Spanish Language and Civilization: Designed to initiate the student to the major language skills; listening, speaking, reading, and writing, in addition to an introduction to Spanish culture.

SPA 102 Qtr. Hrs. - 4 (4,1)
Elementary Spanish Language and Civilization: PR: SPA 101 or equivalent. Continuation of SPA 101.

SPA 103 Qtr. Hrs. - 4 (4,1)
Elementary Spanish Language and Civilization: PR: SPA 102 or equivalent. Continuation of SPA 102.

SPA 201 Qtr. Hrs. - 4 (4,1)
Intermediate Spanish Language and Civilization: PR: SPA 103 or equivalent. Designed to continue development of language skills at the intermediate level, together with a review of grammar, study of syntax, idiomatic expressions, extensive reading, and further study of Spanish culture.

SPA 202 Qtr. Hrs. - 4 (4,1)
Intermediate Spanish Language and Civilization: PR: SPA 201 or equivalent. Continuation of SPA 201.

SPA 203 Qtr. Hrs. - 4 (4,1)
Intermediate Spanish Language and Civilization: PR: SPA 202 or equivalent. Continuation of SPA 202 with greater emphasis on Spanish civilization from the Middle Ages to the present.

SPA 301 Qtr. Hrs. - 4 (4,0)
Spanish Conversation: PR: SPA 203 or equivalent. Development of skills in conversation and comprehension through practice. This course may be repeated for credit. When repeated, credit will apply to general electives only.

SPA 303 Qtr. Hrs. - 4(4,0)
Spanish Composition: PR: SPA 203 or equivalent. Development of skills in composition. This course may be repeated for credit. When repeated, credit will apply to general electives only.

SPA 311 Qtr. Hrs. - 4 (4,0)
Survey of Spanish Literature: PR: SPA 203 or equivalent. Main literary currents and works from the Middle Ages through the Renaissance and Baroque.

SPA 312 Qtr. Hrs. - 4 (4,0)
Survey of Spanish Literature: PR: SPA 203 or equivalent. Main literary currents and works of the eighteenth and nineteenth centuries.

SPA 313 Qtr. Hrs. - 4 (4,0)
Survey of Spanish Literature: PR: SPA 203 or equivalent. Main literary currents and works from the Generation of 1898 to the present.

SPA 316 Qtr. Hrs. - 4 (4,0)
Survey of Latin-American Literature I: PR: SPA 203 or equivalent. Main literary currents and works from the colonial period to the nineteenth century.

SPA 317 Qtr. Hrs. - 4 (4,0)
Survey of Latin-American Literature II: PR: SPA 203 or equivalent. Main literary currents and works of the nineteenth century.

SPA 318 Qtr. Hrs. - 4 (4,0)
Survey of Latin-American Literature III: PR: SPA 203 or equivalent. Main literary currents and works of the twentieth century.

SPA 321 Qtr. Hrs. - 4 (4,0)
Spanish Short Story: A study of representative 19th and 20th Century Spanish short stories and their authors.

SPA 401 Qtr. Hrs. - 4 (4,0)
Spanish Phonetics and Diction: PR: SPA 303 or equivalent. Spanish phonology with emphasis on phonic groupings.

SPA 402 Qtr. Hrs. -4 (4,0)
Advanced Spanish Conversation: PR: SPA 301. Advanced conversation on directed topics from various disciplines: Literature, art, psychology, philosophy, music, business and the sciences.

SPA 403 Qtr. Hrs. - 4 (4,0)
Advanced Spanish Composition: PR: SPA 303. Readings and written imitations of modern literary styles in the form of themes, sketches, poems and original stories.

SPA 421 Qtr. Hrs. - 4 (4,0)
Golden Age Drama: PR: SPA 311. A study of the drama of the Golden Age with special emphasis on Lope, Tirso, Alarcon, and Calderon. The controversies on the Spanish theatre and its influence abroad.

SPA 423 Qtr. Hrs. - 4 (4,0)
Cervantes I: PR: SPA 311. *Don Quixote* (Part I).

SPA 424 Qtr. Hrs. - 4 (4,0)
Cervantes II: PR: SPA 311. *Don Quixote* (Part II).

SPA 441 Qtr. Hrs. - 4 (4,0)
Nineteenth Century Spanish Literature: PR: SPA 312. Romanticism in Spanish literature.

SPA 442 Qtr. Hrs. - 4 (4,0)
Nineteenth Century Spanish Literature: PR: SPA 312. The realistic and naturalistic novel in Spain.

SPA 443 Qtr. Hrs. - 4 (4,0)
The Generation of 1898: PR: SPA 313. A study of the Generation's main authors and their works.

SPA 451 Qtr. Hrs. - 4 (4,0)
Twentieth Century Spanish Literature: PR: SPA 313. The contemporary Spanish novel.

SPA 452 Qtr. Hrs. - 4 (4,0)
Twentieth Century Spanish Literature: PR: SPA 313. Contemporary Spanish drama and poetry.

SPA 481 4(4,0)
of textual criticism.
literature; explications

SPEECH

SPE 101 Qtr. Hrs. - 3 (3,0)
Fundamentals of Oral Communication: Use of the body and voice; participation in various speaking situations; planning, organizing, and delivering public speeches.

SPE 102 Qtr. Hrs. - 1 (0,1)
Speech Improvement Laboratory: Individual and group practice for students with speech fright and delivery problems. Recommended for all students who want to improve their speaking skills.

SPE 261 Qtr. Hrs. - 5 (4,3)
English Phonetics and American Dialects: Physiological description and visual notation of speech sounds; regional dialects of American English.

SPE 262 Qtr. Hrs. - 4 (4,0)
Psychology of Oral Communication: Psychological principles involved in the communicative process with application to individuals and groups.

SPE 265 Qtr. Hrs. - 4 (4,0)
Voice and Articulation: PR: SPE 101. Introduction to the anatomy of voice and speech production. Analysis of voice and articulation of each student. Exercises for individual improvement.

SPE 360 Qtr. Hrs. - 4 (4,0)
Argumentation and Debate: PR: SPE 101 or C.I. Study and practice in the preparation and delivery of argumentative speeches emphasizing argument, evidence and organization.

SPE 361 Qtr. Hrs. - 4 (4,0)
Persuasion: Motivation: PR: SPE 101 or C.I. A study of motivational factors involved in persuasive speaking to secure belief and action.

SPE 362 Qtr. Hrs. - 4 (4,0)
Platform Speaking: PR: SPE 101 or C.I. Advanced training in selecting and organizing materials for various types of speeches. Practice in thinking and speaking before audiences; contemporary speeches as examples.

SPE 364 Qtr. Hrs. - 5 (5,2)
Physiological Bases of Speech and Hearing: An introduction to the anatomical, physiological, and physical elements underlying the communication process.

SPE 365 Qtr. Hrs. - 2 (2,0)
Parliamentary Procedure: Principles and rules governing participation and leadership in the conduct of formal business meetings.

SPE 366 Qtr. Hrs. - 4 (4,0)
Speech Composition: PR: SPE 101 or C.I. Study and practice in the preparation and delivery of speeches from manuscripts with emphasis on the development of oral style.

SPE 371 Qtr. Hrs. - 3 (3,0)
Speech and Human Relations: Introduction to semantics; symbols and meaning and the relationship with human behavior.

SPE 473 Qtr. Hrs. - 3 (3,0)
Directing Extracurricular Speech Activities: Debate, extemporaneous speech and other speech events; selection and training of contestants; interschool and intramural speech activities.

STATISTICS

STAT 201 Qtr. Hrs. - 4 (4,0)
Principles of Statistics: Introduction to statistical concepts in modern society. Basic principles, frequency distributions, measures of location and dispersion, probability, probability distributions, statistical inference.

STAT 301 Qtr. Hrs. - 4 (4,0)
Fundamentals of Probability and Statistics: PR: Four years of high school mathematics or MATH 106 or MATH 110 or equivalent. Course introducing probability and statistical inference including: estimation, hypothesis testing, binomial and normal distributions, small samples, regression and correlation.

STAT 332 Qtr. Hrs. - 3 (3,0)
Statistical Quality Control: Statistical concepts and methods applied to the control of quality of manufactured products. (Same as IEMS 332.)

STAT 335 Qtr. Hrs. - 3 (3,0)
Probability and Statistics for Engineers: PR: MATH 323. Axioms of probability; combinatorial and geometrical probability; probability distributions; measures of location and dispersion; sampling and sampling distributions; estimation and tests of hypotheses; engineering applications. (Same as ENGR 371.)

STAT 341 Qtr. Hrs. - 3 (3,0)
Mathematical Statistics I: PR: MATH 323 and a course in statistics. Sample space, probability axioms, distribution functions, sampling distributions, interval estimation, hypothesis testing, multivariate normal, regression and correlation, linear models, analysis of variance, distribution-free methods.

STAT 342 Qtr. Hrs. - 3 (3,0)
Mathematical Statistics II: PR: STAT 341. Continuation of STAT 341.

STAT 343 Qtr. Hrs. - 3 (3,0)
Mathematical Statistics III: PR: STAT 342. Continuation of STAT 342.

STAT 401 Qtr. Hrs. - 4 (4,0)
Statistical Methods I: PR: One course in statistics or graduate standing. Statistics in research; methods of analyzing data; statistical concepts and models; estimation; tests of hypotheses; regression and correlation; analysis of variance and covariance; statistical design.

STAT 402 Qtr. Hrs. - 4 (4,0)
Statistical Methods II: PR: STAT 401. A continuation of STAT 401.

STAT 411 Qtr. Hrs. - 3 (3,0)
Experimental Design: PR: STAT 402. Methods of constructing and analyzing designs for experimental investigations; concepts of blocking, randomization, and replication; confounding in factorial experiments; incomplete block designs.

STAT 415 Qtr. Hrs. - 4 (4,0)
Regression Analysis: PR: MATH 317 and STAT 401. Least squares techniques in multiple regression; matrix methods; general linear model; residual analysis; transformations; orthogonal polynomials; stepwise and stagewise procedures; non-linear estimation.

STAT 421 Qtr. Hrs. - 3 (3,0)
Survey Design: PR: STAT 402. Methods of constructing and analyzing designs for survey investigations; simple random, stratified, multistage, and multiphase sampling designs; questionnaire construction; methods of estimation; techniques of survey investigation.

STAT 447 Qtr. Hrs. - 3 (3,0)
Probability Theory and Applications: PR: MATH 324. Axioms of probability, discrete and continuous random variables, characteristic functions, Markov chains, recurrent events, sequences of random variables, random walk, simple stochastic processes.

STAT 501 Qtr. Hrs. - 3 (3,0)
Statistical Analysis: PR: A course in statistical methods and a course in mathematical statistics. This course relates the ideas of probability and statistics, including distribution theory, to the collection and analysis of data.

STAT 535 Qtr. Hrs. - 3 (3,0)
Probability for Engineers: PR: STAT 335. Engineering application of probability, combinatorial analysis, sample space, events, probability, discrete and continuous random variables, and probability distributions. (Same as IEMS 502.)

STAT 536 Qtr. Hrs. - 3 (3,0)
Statistics for Engineers: PR: STAT 335. Engineering application of statistics, significance tests and confidence intervals, tests of hypotheses, simple and multiple regression and correlation. (Same as IEMS 503.)

STAT 547 Qtr. Hrs. - 3 (3,0)
Applied Probability: PR: A course in mathematical statistics. Axioms of Probability Theory. Discrete random variables and probability distributions; Demoivre-Laplace limit theorem; laws of large numbers; markov chains; empahsis on applications.

STAT 601 Qtr. Hrs. - 3 (3,0)
Multivariate Statistical Methods: PR: STAT 501. The concepts of statistical relationships among several variables and methods of estimating and testing such relationships.

STAT 621 Qtr. Hrs. - 3 (3,0)
Spectral Analysis and Time Series Analysis: PR: STAT 547. Stochastic models for observations taken at discrete or continuous time points; methods of analysis for such data.

STAT 631 Qtr. Hrs. - 3 (3,0)
Biostatistics: PR: STAT 501. Models and methods of analysis for the quantal response in toxicity and morbidity experiments; statistical techniques for use in bioassay, carcinogenesis experiments and sensory tests.

STAT 647 Qtr. Hrs. - 3 (3,0)
Probability and Statistics: PR: STAT 547. Probability and measure theory; distributions of continuous random variables; characteristic functions; sequences and sums of random variables; the central limit problem.

T

THEATRE

THA 180 Qtr. Hrs. - 3 (3,0)
Study of Drama and Theatre: Nature of drama and the theatre and basic principles of play analysis.

THA 210 Qtr. Hrs. - 4 (4,0)
Cinema Survey: A broad cultural approach to cinema as theatre. Emphasis on theme and expression in major current films. Satisfies Section B, Cultural and Historical Foundations, in the Environmental Studies Program.

THA 230 Qtr. Hrs. - 3 (3,0)
Interpretation I: Analysis of thought; development of imagination; oral presentation of literary forms; individual problems in interpretive reading. (Recommended for students majoring in English and preparing to teach literature.)

THA 240 Qtr. Hrs. - 4 (4,0)
Technical Theatre Production: History, theory, and practice of technical theatre production.

THA 241 Qtr. Hrs. - 4 (2,4)
Stage Carpentry: Special approaches to construction, painting, rigging, and operation of stage scenery.

THA 242 Qtr. Hrs. - 4 (2,4)
Stage Properties: Design, construction, operation, and management of stage properties. History, style, and decoration of practical, scenic, and hand properties.

THA 280 Qtr. Hrs. - 4 (4,0)
Introduction to Acting: Prepares the beginning actor for University Theatre productions. Emphasis on movement, motivation, voice, characterizational techniques, makeup, and other basic requirements for acting.

THA 290 Qtr. Hrs. - 3 (0,15)
Theatre Practicum I: PR: C.I. Open to all students interested in participating in productions of University Theatre. May be repeated for credit.

THA 310 Qtr. Hrs. - 4 (4,0)
History of the Motion Picture: Development of the film industry; its social and economic impact. (Same as COM 310.)

THA 330 Qtr. Hrs. - 3 (3.0)
Interpretation II: PR: THA 230 or ~~the equivalent and junior standing~~ C.I. Selecting and abridging literary material for platform use; preparation and presentation of program for special and general occasions.

THA 331 Qtr. Hrs. - 3 (3,0)
History of the Theatre: Classic and Renaissance: Development of theatre art from the earliest times through the sixteenth century.

THA 332 Qtr. Hrs. - 3 (3,0)
History of the Theatre 17th and 18th Centuries: Development of theatre art from the Renaissance through the neo-classic period to the beginning of the Romantic Period.

THA 333 Qtr. Hrs. - 3 (3,0)
History of the Theatre: 19th and 20th Centuries: Development of theatre art from the Romantic Period to the modern theatre.

THA 335 Qtr. Hrs. - 3 (3,0)
Oral Interpretation for Performance: PR: THA 230. The application of interpretation techniques to Readers Theatre and Chamber Theatre productions. Some public performances required.

THA 336 Qtr. Hrs. - 3 (3,0)
Oral Interpretation III: PR: THA 230. A study of the theories and practice in the techniques of interpretation, with particular emphasis on reading for children.

THA 341 Qtr. Hrs. - 4 (4,0)
Drama Development I: A study of dramatic works in translation of the Greeks, Romans, and the Medieval Theatre. Extensive readings in the plays of these periods should be expected.

THA 342 Qtr. Hrs. - 4 (4,0)
Drama Development II: A study of dramatic works in translation of the French, German, Spanish, and Italian theatres in the 16th and 17th centuries. Extensive readings in the plays of these periods should be expected. Continuation of THA 341.

THA 343 Qtr. Hrs. - 4 (4,0)
Drama Development III: Continuation of THA 341-342 tracing the development of dramatic works in translation of the 18th and 19th centuries. Extensive readings of plays from the French, German, English, Spanish, Italian, and Russian theatres.

THA 350 Qtr. Hrs. - 4 (4,0)
Theatrical Costume: History and Theory: Historical costume for theatre purposes; period costume in relation to social and cultural development. Fabric, silhouette, color and decoration as related to theatrical characterizations.

THA 351 Qtr. Hrs. - 4 (2,2)
Costume and Makeup Techniques: Analysis, design, construction, and management of costume and makeup in the theatre.

THA 375 Qtr. Hrs. - 4 (3,2)
Modern Stage Movement: Modern movement patterns, analysis, improvisation, and exercise to improve the flexibility and control of the actor's physical means of expression.

THA 380 Qtr. Hrs. - 3 (3,0)
Directing I: Fundamental principles of play-directing; demonstrations of theory in group exercises. Each student is required to direct two short scenes for laboratory presentation and criticism. (Laboratory hours to be arranged, and work in departmental productions.)

THA 381 Qtr. Hrs. - 4 (4,0)
Scene Design I: Study and practice of scene design; perspective drawing, fundamentals of design, and techniques of scene painting. (Service on crew as required.)

THA 382 Qtr. Hrs. - 4 (4,0)
Stage Lighting: PR: Junior standing. Study of stage lighting techniques, practices, and equipment. (Service on light crew is required.)

THA 390 Qtr. Hrs. - 3 (0,15)
Theatre Practicum II: PR: THA 290 or C.I. Primarily an activity course. Student will serve in some position of responsibility in production. May be repeated for credit.

THA 422 Qtr. Hrs. - 4 (4,0)
High School Play Directing: Introduction to the theory and practice of directing and producing, with particular emphasis upon methods practicable in high school and junior college play production.

THA 423 Qtr. Hrs. - 3 (3,0)
Contemporary Theatre and Drama: Trends in theatrical production and dramatic literature in Italy, France, Germany, Russia, and the Scandinavian countries.

THA 424 Qtr. Hrs. - 4 (4,0)
Principles of Motion Picture Art: PR: THA 310 or C.I. Aesthetic consideration of the motion picture as art; critical criteria and stylistic comparisons are established through the viewing of films, reading assignments, and discussion.

THA 425 Qtr. Hrs. - 3 (3,0)
Dramatic Criticism: PR: C.I. Analysis of the nature of past and present day criticism of the drama; practical work in such criticism.

THA 431 Qtr. Hrs. - 3 (3,0)
Modern Theatre Forms: Modern and historical aesthetic analysis of theatre forms; theatrical experience related to playwriting, interpretation, performance, audience response. Theorists studies: Appia, Craig, Artaud, Grotowsky and Knott.

THA 434 Qtr. Hrs. - 4 (4,0)
Modern Motion Picture Technique: PR: THA 310 or C.I. An examination of the techniques of motion picture as art; directing, acting, editing, writing, cinematography.

THA 441 Qtr. Hrs. - 4 (4,0)
Modern Currents in the Theatre: Recent trends in the development of theatre: constructs, production, and design. Study of new theatres: "Happenings," "environments," "guerrilla," "street" theatres, other departures from conventional modes.

THA 486 Qtr. Hrs. - 3 (3,0)
American Theatre and Drama: 18th and 19th Centuries: An examination of the social, cultural and economic influences on the American drama and theatre. Trends in theatrical production and dramatic types, Revolutionary Drama, Social Comedy, Romantic Verse Drama, ethnic characters, and Naturalism.

THA 487 Qtr. Hrs. - 3 (3,0)
American Theatre: 20th Century: A continuation of THA 486, with emphasis placed upon the aesthetic and literary development of the theatre in this century. The New Stagecraft, Agitprop Theatre, Federal Theatre, Antiwar Drama, the Absurdist and the avant-garde theatres will be dealt with in detail.

THA 488 Qtr. Hrs. - 3 (3,0)
Creative Dramatics and Children's Theatre: An introduction to the aesthetical and psychological bases of theatre production for and by young people. The production of children's theatre, play selection, scenery, costumes, management, and touring.

THA 489 Qtr. Hrs. - 3 (3,0)
Studies in Oral Interpretation: PR: THA 230. Individual oral reading projects; an intensive study of the literature for interpretation.

Z

ZOOLOGY

ZOOL 100 Qtr. Hrs. - 4 (3,4)
General Zoology: PR: BIOL 103 or BIOL 110. Introduction to zoology; structure, function and representative groups; current concepts in zoological sciences.

ZOOL 322 Qtr. Hrs. - 4 (2,6)
Vertebrate Histology: PR: ZOOL 100. Anatomy, structure and function of major cell types and tissues.

ZOOL 324 Qtr. Hrs. - 5 (3,4)
Human Anatomy: PR: BIOL 100 or equivalent. Structure of the human body. Not open to students in ZOOL 326, ZOOL 327 or equivalent.

ZOOL 326 Qtr. Hrs. - 4 (2,6)
Comparative Vertebrate Anatomy: PR: ZOOL 100. The vertebrate animals; relationship of organs and systems; and their phylogenetic significance.

ZOOL 327 Qtr. Hrs. - 4 (2,6)
Comparative Vertebrate Anatomy: PR: ZOOL 326. Continuation of ZOOL 326.

ZOOL 330 Qtr. Hrs. - 5 (3,6)
Animal Physiology: PR: BIOL 332 or C.I. Functions of body processes occurring in animals with emphasis on vertebrate physiology.

ZOOL 334 Qtr. Hrs. - 5 (4,3)
Human Physiology: PR: BIOL 110 or equivalent. The physiology and interrelationships of organ systems of the human body.

ZOOL 340 Qtr. Hrs. - 4 (2,6)
Vertebrate Zoology: PR: 8 hours of zoology or C.I. Emphasis on evolution and classification followed by an introduction to vertebrate ecology, natural history and behavior.

ZOOL 345 Qtr. Hrs. - 4 (3,3)
General Entomology: PR: ZOOL 100. Introduction to insects; their identification, biology and ecology.

ZOOL 370 Qtr. Hrs. - 5 (3,6)
Animal Parasitology: PR: ZOOL 100. Identification and life histories of representative parasitic protozoa and helminths emphasizing host-parasite relationships; techniques of animal examination.

ZOOL 423 Qtr. Hrs. - 5 (3,6)
Comparative Vertebrate Embryology: PR: ZOOL 326 and ZOOL 327 or C.I. Embryology of the vertebrates; fertilization of egg; stages of cleavage; development of organs and systems.

ZOOL 442 Qtr. Hrs. - 5 (3,6)
Invertebrate Zoology: PR: 12 hours of biology or C.I. Taxonomy, anatomy and ecology of the invertebrate animals.

ZOOL 445 Qtr. Hrs. - 4 (2,6)
Ichthyology: PR: 8 hours of zoology or C.I. Introduction to the biology of the fishes, their classification, evolution and life histories.

ZOOL 453 Qtr. Hrs. - 3 (3,0)
Zoogeography: PR: BIOL 350. Principles and concepts concerning regional patterns of distribution of the animals of the world, both past and present.

ZOOL 475 Qtr. Hrs. - 4 (3,3)
Vertebrate Ethology: PR: ZOOL 100. Classical ethology, modern experimental ethology and behavioral ecology are considered.

ZOOL 537 Qtr. Hrs. - 3 (3,3)
Endocrinology: PR: ZOOL 330 and CHEM 441 or C.I. Mechanisms of action of hormones; interrelationships between the nervous and endocrine systems.

ZOOL 544 Qtr. Hrs. - 4 (2,6)
Ornithology: PR: 8 hours of zoology or C.I. Introduction to the biology of birds, their classification, evolution and life histories.

ZOOL 546 Qtr. Hrs. - 4 (2,6)
Herpetology: PR: 8 hours of zoology or C.I. Introduction to the biology of the amphibians and reptiles, their classification, evolution and life histories.

ZOOL 547 Qtr. Hrs. - 4 (2,6)
Field Zoology: PR: 12 hours in biological sciences, or science teaching experience or C.I. Classification and identification among major animal groups with emphasis on field experience. Major reference sources reviewed.

ZOOL 548 Qtr. Hrs. - 4 (2,6)
Mammalogy: PR: 8 hours of zoology or C.I. Introduction to the biology of mammals, their classification, evolution and life histories.

ZOOL 558 Qtr. Hrs. - 4 (3,3)
Fishery Biology: PR: BIOL 450 and ZOOL 445. The biology and management of important commercial and game fishes; case histories of selected fisheries and analysis of methodology.

ZOOL 572 Qtr. Hrs. - 3 (3,0)
Principles of Zoological Systematics: PR: BIOL 460 and 15 hours of zoology courses of 300 level or above. Theory and practice of taxonomy and classification of animals; introduction to the International Code of Zoological Nomenclature.

ZOOL 576 Qtr. Hrs. - 5 (3,6)
Aquatic Invertebrates: PR: ZOOL 442 or C.I. A faunistic survey of major invertebrate group associated with aquatic environments in Florida.

ZOOL 632 Qtr. Hrs. - 5 (3,6)
Comparative Animal Physiology: PR: CHEM 441 or C.I. Functional adaptations to physiological stresses developed in exploitation of diverse habitats.

ZOOL 671 Qtr. Hrs. - 4 (4,0)
Contemporary Studies in Zoology: PR: Graduate standing. Analysis of current publications and developments in animal science.