iod. Required preparation: CHEM 244 may be taken concurrently. Open to sophomores.

251Q. Introduction to Quantum Chemistry
First semester. Three credits. Prerequisite: CHEM 264. An introduction to quantum theory and its applications to atomic and molecular structure and spectroscopy.

256. Physical Chemistry Laboratory
First semester. One credit. One 3-hour laboratory period. Required preparation: CHEM 263 which may be taken concurrently. Not open for credit to students who have passed CHEM 265. This laboratory course is for students majoring in chemical engineering and cannot be counted toward the chemistry major group.

Laboratory experiments in thermodynamics, kinetics and spectroscopy.

263Q-264Q. Physical Chemistry
Both semesters. Four credits each semester. Prerequisite: CHEM 128 or 130 or 139 or 152 or 154; PHYS 123, or 132, or 142, or 152; MATH 210 or 220 for CHEM 263; and MATH 211 or 221 for CHEM 264. A study of gases, liquids, solids, solutions, and thermodynamics in CHEM 263 and kinetics, atomic and molecular theory and spectroscopy in CHEM 264.

265S. Physical Chemistry Laboratory (W,C)
Either semester. Two credits. Two 3-hour laboratory periods. Required preparation: CHEM 264, which may be taken concurrently.

270W. Technical Communications

This course will cover various aspects of technical writing and oral presentation of technical reports. The student will be introduced to the broad spectrum of the chemical literature; various approaches to information retrieval, including computer searches, will be demonstrated. Short reports based on chemical literature will include references and bibliographies. A major paper on a technical topic will be evaluated and corrected at each stage of its development. An oral report based on this material will also be required.

280. Polymeric Materials
Second semester. Three credits. Required preparation: CHEM 244. Not open for credit to students who have passed CHEG 256.

Structure, properties and chemistry of high polymers. Methods of production and applications.

291. Variable Topics
Either semester. Three credits. With a change in topic, may be repeated for credit. Prerequisites, required preparation, and recommended preparation vary.

295. Undergraduate Seminar
First semester. One credit. Open only with consent of instructor. With a change of subject, this course may be repeated once for credit.

Reports and discussions of topics relevant to further study in the field of chemistry.

296. Undergraduate Research
Either or both semesters. Credits, not to exceed 3 each semester, and hours by arrangement (three laboratory hours for each credit). Open only with consent of instructor.

Original investigation carried on by the student under the guidance of a staff member. The student is required to submit a brief report at the end of each semester.

297W. Thesis for Undergraduate Chemistry Majors

Either semester. Three credits. Hours by arrangement. Prerequisite: A minimum of three credits in CHEM 296 or 299. Open only with consent of instructor. A formal thesis is required, based on original investigation carried on by the student.

298. Special Topics
Either semester. Credits and hours by arrangement. With a change in content, may be repeated for credit. Prerequisites, required preparation, and recommended preparation vary.

299. Independent Study
Either or both semesters. Credits, not to exceed 3 per semester, and hours by arrangement. Open only with consent of instructor. With a change of subject, this course may be repeated for credit.

Civil & Environmental Engineering (CE)

Head of Department: Professor Erling Murtha-Smith
Department Office: Room 302, F.L. Castleman Building

For major requirements, see the School of Engineering section of this Catalog.

Courses in Applied Mechanics are listed under that heading, immediately following the Civil Engineering courses. Also see courses listed under Engineering.

222. Civil Engineering Materials
Second semester. Three credits. Two lectures. One 3-hour Laboratory. Prerequisite: CE 287 which may be taken concurrently. Accorsi, Frantz, Martha-Smith

Engineering properties of steel, Portland cement concrete, bituminous cement concrete, and timber; laboratory measurement of properties; interpretation of results. Written reports.

222P. Civil Engineering Materials
Must be taken with another P course in Civil Engineering to equal one W course.

230. Mechanics of Materials and Structures Laboratory
Two credits. One hour lecture and one 2-hour Laboratory. Prerequisite: CE 234 and CE 236, which may be taken concurrently, and CE 222. Martha-Smith, Davis

Laboratory experiments to complement, reinforce and develop concepts learned in Mechanics of Materials, Basic Structural Analysis and Basic Structural Design. Topics include tension, torsion, flexure and buckling. Written reports.

234. Basic Structural Analysis
Second semester. Three credits. Prerequisite: CE 287. Accorsi, DeWolf, Epstein, Frantz, Leonard, Malta

Analysis of statically determinate structures; influence lines; deflection of trusses, beams, and frames; introduction to indeterminate analysis using consistent deformation and moment distribution; computer programming.

236. Basic Structural Design
Second semester. Four credits. Three class periods and one 3-hour Laboratory. Prerequisite: CE 287. DeWolf, Epstein, Frantz, Malta, Martha-Smith


237. Advanced Structural Analysis
First semester. Three credits. Prerequisite: CE 234. DeWolf, Epstein, Leonard, Malta


238. Reinforced Concrete Structures Design
First semester. Three credits. Prerequisite: CE 235 and 236. DeWolf, Epstein, Frantz

Design for flexure, shear, torsion, and axial loads; two-way slabs; serviceability considerations. Applications to buildings.

239. Steel Structures Design
Second semester. Three credits. Prerequisite: CE 234 and 236. DeWolf, Frantz

Beam columns, composite members, plate girders, connections; introduction to plastic design. Applications to buildings. Written reports.

239P. Steel Structures Design
Must be taken with another P course in Civil Engineering to equal one W course.

240. Soil Mechanics and Foundations
First semester. Four credits. Three class periods and one 3-hour laboratory period. Prerequisite: CE 287 and CE 297, both of which may be taken concurrently. Demars

Fundamentals of soil behavior and its use as a construction material. Effective stress principle, seepage and flow nets, consolidation, shear strength, limit equilibrium analysis. Written reports.

240P. Soil Mechanics and Foundations
Must be taken with another P course in Civil Engineering to equal one W course.

241. Foundation Design
First semester. Three credits. Prerequisite: CE 240. Demars

Application of soil properties to design of foundations, retaining structures, excavation drainage, shallow footings, deep foundations, specifications, subsurface exploration.

242. Soils Engineering
Second semester. Three credits. Prerequisite: CE 240.

Earth structures, slope stability, consolidation and settlement of soil, vertical drains, surcharging, pressures on buried pipes, and tunnels, numerical solutions.

242P. Soils Engineering
Must be taken with another P course in Civil Engineering to equal one W course.

251. Civil Engineering Systems
(Also offered as ENVE 251.) First semester. Three credits. Open to sophomores. Anagnostou, Garrison

Application of statistical principles to the analysis of problems. Topics covered include normal, poisson, and binomial distributions, chi square, comparison of means and variances, least square and regression analysis.

254. Transportation Facilities Design
Second semester. Three credits. Recommended preparation: CE 271 or consent of instructor. Open to sophomores. Davis, Ferguson, Garrison

Design and horizontal and vertical curves, earthwork, runoff and simple drainage structures. Elements of traffic engineering and site development.

256. Advanced Civil Engineering Systems
Second semester. Three credits. Prerequisite: CE 251, or consent of instructor. Davis

Optimization, decision and risk analysis, and simulation in design of civil engineering systems. Network analysis and project scheduling.
256P. Advanced Civil Engineering Systems
Must be taken with another P course in Civil Engineering to equal one W course.

260. Water Quality Engineering
(Also offered as ENVE 260.) Second semester. Three credits. Prerequisite: CE 263 and CE 297 or CHEG 223. Aboud, Smets
Physical, chemical, and biological principles for the treatment of aqueous phase contaminants; reactor dynamics and kinetics. Design projects.

262. Environmental Engineering Laboratory
(Formerly offered as CE 264.) (Also offered as ENVE 262.) Second semester. Three credits. Two class periods and one 3-hour laboratory period. Prerequisite: CE 263 and CE 297 or CHEG 223 (which may be taken concurrently). Aboud, Smets
Aqueous analytical chemical techniques, absorption, coagulation/flocculation, fluidization, gas stripping, biokinetics, interpretation of analytical results, bench-scale design projects, written and oral reports.

262P. Environmental Engineering Laboratory
Must be taken with another P course in Civil Engineering to equal one W course.

263. Environmental Engineering Fundamentals
(Also offered as ENVE 263.) Both semesters. Three credits. Prerequisite: CHEM 128 or 130 and MATH 211 (which may be taken concurrently). Open to sophomores. Houg, Nikolaidis, Smets

265. Hydraulic Engineering
(Also offered as ENVE 265.) Second semester. Three credits. Prerequisite: CE 297 or CHEG 223 and CHEG 224. Anagnostou, Nikolaidis, Ogden
Design and analysis of water and wastewater transport systems, including pipelines, pumps, pipe networks, and open channel flow. Introduction to hydraulic structures and porous media hydraulics. Computer applications.

266. Hydraulic Engineering Laboratory
(Also offered as ENVE 266.) Second semester. Two credits. One class period. One 2-hour Laboratory. Prerequisite: CE 297.
Tests and investigation of the flow of oils, water, and other fluids through orifices, nozzles, wires and pipes; calibration of measuring devices; experiments with turbines and pumps.

267. Engineering Hydrology
(Also offered as ENVE 267.) First semester. Three credits. Prerequisite: CE 297 or CHEG 223 and CHEG 224. Anagnostou, Nikolaidis, Ogden

267P. Engineering Hydrology
Must be taken with another P course in Civil Engineering to equal one W course.

268. Limnology
(Also offered as CEWEB 247 and ENVE 268.) First semester. Three credits. Prerequisite: MATH 109 or 112 or 115 and an introductory course in CHEM 122, 127, or 129; an introductory course in Biology is recommended. Physical, chemical, and biotic interrelationships of freshwater habitats.

269. Selected Environmental Problems
Second semester. Three credits. Open to sophomores. Ecological effects of pollution and despoilment. Organized and rational study of specific environmental problems, including social, economic, political, and legislative aspects.

271. Elementary Surveying
First semester. Four credits. Three lecture periods and one 3-hour Laboratory. Prerequisite: MATH 107 or MATH 112 or 115, or consent of instructor. Open to sophomores. Ferguson
The theory and practice of plane surveying including: error analysis, measurement of horizontal distances, leveling, traverse and area computations, adjustments of traverses and level nets, adjustments of instruments, topographic mapping, state coordinate systems, and boundary surveys.

274. Photogrammetry
Second semester. Three credits. Two class periods. One 3-hour Laboratory. Prerequisite: CE 271. Offered in alternate years. Ferguson
The fundamentals of aerial photogrammetry, including: flight planning, the geometry of the aerial photograph, ground control, radial line plotting, tilt, stereoscopic and parallax, stereoscopic measurements, and topographic mapping.

275. Route Surveying
Second semester. Three credits. Two class periods. One 3-hour Laboratory. Prerequisite: CE 271. Offered in alternate years. Ferguson
Reconnaissance and route selection, simple, compound and reverse horizontal curves, spirals, vertical curves, earthwork, cross-sectioning, slope staking, and observations for the meridian.

276. Computer Aided Civil Engineering Design
Second semester. Three credits. One 3-hour class period. Prerequisite: CE 254, which may be taken concurrently, and CE 271. Ferguson
Design of Civil Engineering projects using computer software to analyze engineering problems and create design drawings.

279. Environmental Modeling
(Also offered as ENVE 279.) Second semester. Three credits. Prerequisite: CE 263 and CHEG 223 or CE 297 or consent of instructor. Nikolaidis
Systematic approach for analyzing contamination problems. Systems theory and modeling will be used to assess the predominant processes that control the fate and mobility of pollutants in the environment. Assessments of lake eutrophication, conventional pollutants in rivers and estuaries and toxic chemicals in groundwater.

280W. Civil Engineering Projects
Either semester. Three credits. Two 3-hour laboratory periods. Prerequisite: Departmental consent required. This course can be taken no sooner than the semester in which the student completes the Professional Requirements for the B.S. degree. Design of Civil Engineering Projects. Students working singly or in groups produce solutions to Civil Engineering design projects from first concepts through preliminary proposals, sketches, cost estimations, design, evaluation, oral presentation and written reports.

281. Engineering Economics
Second semester. One credit. Given as two 1-hour class periods weekly during first half of semester only. Prerequisite: Senior standing.
Costs of Civil Engineering projects; components of cost estimating; comparison of alternate designs; cost-benefit analysis; useful life and depreciation; basic methods of project financing.

289. Intermediate Mechanics of Materials
Second semester. Three credits. Prerequisite: CE 287. This course and ME 229 may not both be taken for credit.

Applied Mechanics

211. Applied Mechanics I
Either semester. Three credits. Not open to students who have passed CE 213 or 214. Prerequisite: MATH 210, which may be taken concurrently, and ENGR 150 or CSE 110 or CSE 123C. Open to sophomores.
Fundamentals of statistics using vector methods. Resolution and composition of forces; equilibrium of force systems; analysis of forces acting on structures and machines; centroids; moment of inertia. Computer applications.

212. Applied Mechanics II
Either semester. Three credits. Not open to students who have passed CE 215. Prerequisite: CE 211, MATH 210. This course and CE 213 may not both be taken for credit. Open to sophomores.
Fundamentals of dynamics using vector methods. Rectilinear and curvilinear motion, translation, rotation, plane motion; work, energy and power; impulse and momentum. Computer applications.

287. Mechanics of Materials
Either semester. Three credits. Prerequisite ENGR 150 or CSE 110, CE 211 or CE 214 and CE 215, which may be taken concurrently. Open to sophomores.
Simple and combined stress, torsion, flexure and deflection of beams, continuous and restrained beams, combined axial and bending loads, columns. Computer applications.

299. Independent Study for Undergraduates
Either or both semesters by arrangement. Credits by arrangement, not to exceed 4 per semester. Open only with consent of supervising instructor. Course may be repeated for credit.
Designed for students who wish to extend their knowledge in some specialized area of civil engineering.
Stresses and strains, curved beams, torsion of non-circular sections, flat plates, strain-energy, deflections. Impact and energy loads, repeated stress, mechanical properties of materials and theories of failure, influence of stress concentration.

287. Fluid Mechanics
Either semester. Three credits. Prerequisite: CE 212 or CE 215, which may be taken concurrently, and MATH 210 and 211. This course and ME 250 may not both be taken for credit.

Statics of fluids, analysis of fluid flow using principles of mass, momentum and energy conservation from a differential and control volume approach. Dimensional analysis. Application to pipe flow and open channel flow.

Head of Department: Professor Harvey R. Gilbert
Department Office: Room 213, Communication Sciences Building

For major requirements, see the College of Liberal Arts and Sciences section of this Catalog.

102. The Process of Communication
Either semester. Three credits. Priddy
A study of modern communication theories and principles useful in understanding how people affect and are affected by others through communication.

105. Principles of Public Speaking
Either semester. Three credits.
Theory and performance in public speaking: overcoming apprehension; audience analysis; development of concepts; maximizing message impact; professional presentation skills; group projects; evidence; listening and speech evaluation.

135. Mass Communication Systems
Either semester. Three credits.
The history, organizational structure, economics and functioning of technologically-based communication systems and the relationship of these factors to mass communication issues and effects.

201. Speech Science
First semester. Three credits. Three class periods.
Acoustic, anatomical, neurological and physiological principles fundamental to the understanding of voice and speech production.

202. Speech and Language Acquisition
Either semester. Three credits.
How children learn their first language; the effects of language on their thinking and behavior.

204. Methods and Issues in Child Language Research
Second semester. Three credits. Two class periods, and child observations and individual conferences by arrangement. Prerequisite: COMS 202. Open only with consent of instructor.

205. Interpersonal Communications
Either semester. Three credits. Prerequisite: COMS 102 or consent of instructor. Van Lear
An introduction, analysis and critique of recent theories of interpersonal communication. Topics include person perception, theories of communication management, and the structural analysis of face to face communication behavior.

206W. Global Communication
International communication patterns; globalization of media industries; new technologies; communication in war and peace; political, economic, social and cultural effects.

207. Nonverbal Communication
First semester. Three credits. Recommended preparation: COMS 231Q. Buck
Facial expression, body movement, spatial behavior and para-language, with a consideration of applications for information theory.

208. Communication and Change
First semester. Three credits. Recommended preparation: COMS 235 and 210. Snyder
The role of communication and communication technologies in social change, diffusion of new ideas, and education. Special application to third world development.

209. Cross-Cultural Communication
Communication behavior within and across cultures and subcultures.

210. Persuasion
Either semester. Three credits. Three class periods or two class periods with one discussion period. Prerequisite: COMS 102 or consent of instructor. Hamilton
Introduction to theories of attitude formation, change and reinforcement. Research is used to evaluate past and present models of persuasion.

211. Research Practicum in Communication
Either semester. Credits and hours by arrangement, with a maximum of three credits per semester. Prerequisite: At least 12 credits of 200-level Communication Sciences courses which must include COMS 231Q and consent of instructor. Should be taken during the senior year. May be repeated once for credit.

This course is designed to provide students with an opportunity to participate in a variety of supervised research activities in communication.

1212. Internship in Communication
Either semester. Credits and hours by arrangement, with a maximum of three credits per semester. Prerequisite: At least 12 credits of 200-level Communication Sciences courses and consent of instructor. Should be taken during the senior year. May be repeated once for credit.

This course is designed to provide students with opportunity for supervised field work in a professional communication organization. Student’s performance will be evaluated both by the field supervisor and course instructor.

213W. Media, State, and Society

214W. Advanced Nonverbal Communication
Second semester. Three credits. Prerequisite: COMS 207 or consent of instructor. Recommended preparation: COMS 205. Buck
Selected issues and research techniques current in the literature. Research projects of kinetic proxicom,

† Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

215. Public Relations
 Either semester. Three credits. Prerequisite: COMS 135. Required preparation: COMS 231Q, and 235 or consent of instructor.
Practical applications of major theories of communication and mass media to public relations practiced by organizations. Based on readings, student research, and case histories.

216W. Small Group Communication
Approaches, methods, and findings of research in small group communication and development of an ability to engage effectively in small group situations.

217. Organizational Communication
Second semester. Three credits. Prerequisite: COMS 205 and 231Q or consent of instructor. van den Berg
Communication in formal organizations; horizontal and vertical communication; effectiveness of different organizational structures and channels; feedback; networks; norms and roles.

218. Communication Campaigns and Applied Research
Second semester. Three credits. Prerequisite: COMS 231Q, or STAT 100V or 101V. Recommended preparation: COMS 135, 235, and 210. Snyder
Application of media, persuasion, and social change theories to the design of communication campaigns, including focus groups, interviews and other background research. Students will work with community organizations.

219. Advanced Persuasion and Communication
Either semester. Three credits. Prerequisite: COMS 210 or consent of instructor. Recommended preparation: COMS 231Q and COMS 235.
Advanced consideration and criticism of selected modern persuasion theories and research in communications.

220. Communication Processes in Advertising
Either semester. Three credits. Prerequisite: COMS 135. Required preparation: COMS 235 and 210 or consent of instructor.
Covers communications theory relevant to advertising, with specific application to the creative elements of art and copy. Students create actual print advertisements and radio commercials.

222W. Government Communication
Either semester. Three credits. Prerequisite: COMS 102. Priddy
Communication in government processes. Communication theory and practical applications. Issue management, lobbying, interest-group strategies, government relations, grassroots action, and coalition building. Students may not pass this course without passing the written work.

224. Introduction to Semantics
Either semester. Three credits. Prerequisite: COMS 102 or consent of instructor.
The relationship among people, words, and meaning.

226. Gender and Communication
Either semester. Three credits. Prerequisite: COMS 102.
Differences in male/female communication, and the role of discourse in the production of those differences. The politics of gender and communication.
230. Introduction to Research Literature in Communication
First semester. Three credits. Required preparation: COMS 205, 231Q, 235, and 210 or consent of instructor.
A survey of research in major sub-areas of communication.

231Q. Research Methods in Communication
Either semester. Three credits. Prerequisite: COMS 102 or consent of instructor. van den Berg
The scientific approach as it specifically applies to communication.

233. Television Production
Either semester. Three credits. Prerequisite: COMS 102 and 133 and consent of instructor.
This course provides the student with hands-on broadcast and industrial video production. The students will rotate through all studio positions for a televised production and complete field shoots and editing for an electronic field production project. Preproduction skills such as proposal and script writing, storyboarding and budgeting will be included in each class project.

234. Information and Communication
Either semester. Three credits. Prerequisite: COMS 231Q or consent of instructor. Watt
Approaches to studying communication including cybernetics, general systems theory, information theory, and human information processing.

235. Effects of Mass Media
Either semester. Three credits. Prerequisite: COMS 102 or consent of instructor.
An analysis of the roles of the mass media and of the effects they exert on individuals and society.

236. Protest and Communication
Either semester. Three credits. Required preparation: COMS 235 or consent of instructor. With a change in content, this course may be repeated once for credit. Protest movement – past and current – in light of principles, models, and theories of communication.

237. Design of Human Communication Systems
Either semester. Credits and hours by arrangement. Required preparation: COMS 135, 235 or consent of instructor. With a change in content, this course may be repeated once for credit.
Application of communication theory and principles of information science to the design of modern systems of communication, with consideration given to the physical and social settings in which they will be used.

238. Mass Media and Political Process
Either semester. Three credits. Required preparation: COMS 135, 235 and 210 or consent of instructor. Gaztambide-Geigel
An introduction to the role of the mass media in the American political process. Topics include the relationships among the media, major political institutions, and citizenry; the interplay of the media, interest groups, and policymaking process; and the role of the media in elections and international crises.

239. New Communication Technologies
An overview of new communication technologies, their operation, future potential, dangers, and effects on social structure.

241. Sign Language: Theory and Practice
Second semester. Three credits. Information about the history, structure and use of sign languages, and instruction in the basics of American Sign Language (ASL) and Signed English.

243. Introduction to Speech Pathology
First semester. Three credits. A survey of the field of speech pathology and audiology.

245. Speech Pathology I
First semester. Three credits. Two class periods and one 2-hour laboratory period. Prerequisite: COMS 201, 243, and 247. Coelho
The nature, etiology, and assessment of communication disorders.

246. Speech Pathology II
Second semester. Three credits. Prerequisite: COMS 245.
Clinical approaches to the treatment of articulation disorders, the clinical process, and the public school speech and hearing program.

247. Introduction to Phonetic Principles
Second semester. Three credits. Prerequisite: COMS 201.
The analysis of speech through the application of phonetic theory.

248. Introduction to Audiology
Second semester. Three credits. Prerequisite: COMS 250. Cienkowski
An Introduction to the nature, causation, assessment and management of hearing impairment and the principles and techniques of public school conservation programs.

249. Introduction to Aural Rehabilitation
First semester. Three credits. Prerequisite: COMS 248. Maxon
An introduction to the effects of hearing impairment on communication. Communication strategies for adults and children with impaired hearing are discussed.

250. Audition
First semester. Three credits. Cohen
The response to acoustic stimuli including methodology and instrumentation.

252. Introduction to Language Pathologies
First semester. Three credits. Prerequisite: COMS 202. Grela
A review of development, measurement, and function of language and a survey of language disorders and their causes.

256. Media and Special Audiences
(Also offered as PRLS 260.) Either semester. Three credits. Recommended preparation: COMS 102. Ris
Media content and audience responses. Ethnic, racial, and gender issues in mainstream and ethnic media. Special audiences include Latina/os, African Americans, Asian Americans, Women, Gays, Lesbians.

283. Foreign Study
Either or both semesters. Credits and hours by arrangement. May be repeated for credit. Consent of Department Head required, normally granted prior to the student’s departure. May count toward the major with consent of the advisor. Special topics taken in foreign study program.

296W. Senior Thesis
Either semester. Credits and hours by arrangement. Open only with consent of instructor.
Preparation of a thesis and its presentation to the department.

297. Variable Topics
Either semester. Three credits. With a change in topic, may be repeated for credit. Prerequisites, recommended preparation, and recommended preparation vary.

298. Special Topics
Either semester. Credits and hours by arrangement. With a change in content, may be repeated for credit. Prerequisites, recommended preparation, and recommended preparation vary.

299. Independent Study
Either or both semesters. Credits and hours by arrangement. Open only with consent of instructor. With a change of content, may be repeated for credit.
The course, for superior students, includes independent reading, periodic conferences, and such other work as desired by the instructor.
**Computer Science and Engineering (CSE)**

**Interim Head of Department:** Professor Reda Ammar

**Department Office:** Room 460, United Technologies Engineering Building

For major requirements, see the School of Engineering section of this Catalog.

(Computer Science & Engineering courses were formerly offered under the CS department abbreviation using the same course numbers.)

**101C. Computers in Modern Society**

Second semester. Three credits. Two class periods and two 1-hour program design periods. Not open for credit to students who have passed CSE 110C or CSE 123C or CSE 130C. Students who anticipate extensive study or use of computers in their future work should take CSE 110C-111, or CSE 123C-124C, or CSE 130C rather than this course. Ungar

Introduction to computer applications in the humanities, social sciences, business, and other fields. Influence of the computer on modern society and technology. Elements of computer usage in the solution of numeric and non-numeric problems including introduction to programming methods.

**110C. Introduction to Numerical Computation**

Either semester. Three credits. Two 1-hour class periods and two 1-hour program design periods. Required preparation: MATH 110Q or MATH 113Q or MATH 115Q, which may be taken concurrently. This is a very demanding course and is recommended for students who have had previous programming experience and have a high level of motivation for using computers in future work. Not open for credit to students who have passed CSE 111 or CSE 111 or CSE 123C or CSE 124C. Either CSE 110C-111 or CSE 125C-124C or CSE 130C is required of students planning on taking advanced CSE courses. Demurjian, Ungar

Introduction to computer organization and the computing process. Design of algorithms for computer solutions of problems, structured programming, and data organization. Analysis of computational errors and their minimization. Methods of solving numerical problems. Logic, design, verification and documentation of programs using current programming languages.

**111. Introduction to Non-Numerical Computation**

Either semester. Two credits. Two 1-hour class periods and one 1-hour program design period. Prerequisite: CSE 110C or consent of instructor. Not open for credit to students who have passed CSE 124C or CSE 130C. Either CSE 110C-111 or CSE 123C-124C or CSE 130C is required of students planning on taking advanced CSE courses. Ungar

Design of algorithms for the processing of non-numerical information. Linked lists, trees and other advanced data structures. Practice in the design and realization of complex information processing programs.

**123C. Introduction to Computing**

Both semesters. Two credits. Two class periods of lecture and one 1-hour of laboratory period per week. Prerequisite: Passed Q test. No previous programming experience required. Not open for credit to students who have passed CSE 110C or CSE 130C. Ungar

Problem solving with the computer, basics of data representation and computer organization, procedural and object-oriented programming in a modern language including control structures, functions and parameter passing, one and two dimensional arrays, numerical error and basic numerical methods. Examples taken from various disciplines. Programming projects required. Intellectual property issues discussed.

**124C. Computing**

Second semester. Four credits. Three class periods of lecture and one 1-hour laboratory period per week. Prerequisite: CSE 123C or CSE 110C. Not open for credit to students who have passed CSE 111 or CSE 130C. Ungar

Principles of object oriented programming including polymorphism, information hiding, and inheritance. Principles of object oriented design. Recursion. Strings, lists, stacks, queues, trees, priority queues, heaps and graphs including their use and various implementations using automatic and dynamic data allocation, linked representations, and templates. Algorithm and complexity issues involved with these data types. Sorting and searching algorithms. Introduction to computer history. Programming problems drawn from areas of computer science and engineering.

**130C. Fundamentals of Computation**

First semester. Four credits. Two 1-hour class periods and two 1-hour program design periods. Prerequisite: MATH 110Q or MATH 113Q or MATH 115Q, which may be taken concurrently. This is a very demanding course and is recommended for students who have had previous programming experience and have a high level of motivation for using computers in future work. Not open for credit to students who have passed CSE 111 or CSE 111 or CSE 123C or CSE 124C. Either CSE 110C-111 or CSE 125C-124C or CSE 130C is required of students planning on taking advanced CSE courses. Ungar

Design of algorithms to solve numerical and non-numerical problems. Top-down design techniques and structured programming. Investigation and selection on data organizations for efficient problem solutions. Analysis of computational errors in numerical calculations. Methods for the design, implementation, verification and documentation of programs using current programming languages.

**201. Computer Architecture**

Either semester. Three credits. Prerequisites: CSE 111 or 124C or 130C. Not open to students who have credit for CSE 207 or CSE 241. Open to sophomores.

Structure and operation of digital systems and computers. Fundamentals of digital logic. Machine organization, control and data paths, instruction sets, and addressing modes. Hardwired and microprogrammed control. Memory systems organization. Discussion of alternative architectures such as RISC, CISC, and various parallel architectures.

**207. Digital Logic**

Either semester. Three credits. Three class periods and one 1-hour discussion period. Required preparation: CSE 111 or 124C or 130C. Open to sophomores. Ammar, Lipsky, McCarteney

Representation of digital information. Introduction to the analysis and design of combinational and sequential logic networks using Boolean algebra and register transfer techniques. Structure and operation of digital systems and computers. Introduction to programming at the machine and assembler language level. Design projects.

**208W. Logic Design Laboratory**

Either semester. Two credits. One 1-hour lecture and one 2-hour laboratory period. Prerequisite: Secondary school physics or PHYS 101, and CSE 207 which may be taken concurrently. Open to sophomores. Barker

Design and evaluation of combinational and sequential logic circuits. Debugging techniques. Use of computer facilities for circuit simulation, CAD and report preparation and presentation.

**221. Probabilistic Performance Analysis of Computer Systems**

Either semester. Three credits. Prerequisite: Either CSE 111 or 124C or 130C, and either CSE 241 or CSE 243, and one of STAT 220C, 222C, 230Q or MATH 231Q, and MATH 227Q. Ammar, Lipsky

Introduction to the probabilistic techniques which can be used to represent random processes in computer systems. Markov processes, generating functions and their application to performance analysis. Models which can be used to describe the probabilistic performance of digital systems.

**228. Parallel Systems**

Either semester. Three credits. Three class periods and one problem session. Prerequisite: CSE 111 or 124C or 130C. Open to sophomores. Demurjian, Peters

Software engineering concepts including the software life cycle and other software-development process models. Specification techniques, design methodologies, performance analysis, and verification techniques. Team-oriented software design and development, and project management techniques. Introduction to a modern programming language and the associated design and debugging tools. Homework and laboratory projects that emphasize design and the use/features of a modern programming language.

**233. Programming Languages**

Either semester. Three credits. Prerequisite: CSE 111, or 124C or 130C.

The study of programming language features and programming paradigms. Data types, control, run-time environments, and semantics. Examples of procedural, functional, logical, and object-oriented programming. Features used for parallel and distributed processing. Classic and current programming languages and environments.

**237. Theory of Computation**

Either semester. Three credits. Prerequisite: CSE 259 and either CSE 254 or MATH 214.

Formal models of computation, such as finite state automata, pushdown automata, and Turing machines, and their corresponding elements in formal languages (regular, context-free, recursively enumerable). The complexity hierarchy. Church’s thesis and undecidability. NP completeness. Theoretical basis of design and compiler construction.

**240. Intermediate Computer Systems Laboratory**

Either semester. Three credits. Two hours lecture and 4 hours laboratory. Prerequisite: CSE 111 or 124C or 130C, and CSE 241 which may be taken concurrently. Chip level programming of microprocessor type systems. Topics covered include I/O ports, I/O devices and controllers, DMA channels, priority interrupts, networking, multitasking. Design projects.

**241. Computer Organization**

Either semester. Three credits. Prerequisite: CSE 207, and CSE 208W which may be taken concurrently. Ammar, Peters

Fundamentals of computer organization.
Instruction sets and addressing modes. The control path and microprogramming. The data path, fast arithmetic. The memory hierarchy, both logical and physical aspects. The input/subsystem; interrupts, DMA, structure and function. SIMD and MIMD parallelism. Modern architectural theories.

243. Introduction to Computer Architecture and Hardware/Software Interface
Either semester. Four credits. Three hours lecture and three hours laboratory. Prerequisite: CSE 207 and CSE 208W. Not open for credit to students who have credit for CSE 241. Ammar, Greenshields
An integrated introduction to computer organization and the hardware/software interface as seen at the assembly-language level. Topics included: basic machine organization; instruction sets and addressing modes; CPU design; the control path and microprogramming; FSM design; the data path; integer and floating-point arithmetic; busses; the memory hierarchy; the i/o subsystem; RISC architectures; pipelining; basic performance analysis; fundamentals of networking. Lab activities include (but are not limited to): basic assembly language programming on a CICS and RICS processor; processor benchmarking; use of cache; polled, interrupt driven and DMA I/O files; optimizing code.

244. Programming Language Translation
Either semester. Three credits. Prerequisite: CSE 254 or MATH 210Q or CSE 230. Santos
Introduction to the formal definition of programming language syntax and semantics. Design and realization of programming language processing systems such as assemblers, compilers, and interpreters.

245. Computer Networks and Data Communication
Semester by arrangement. Three credits. Prerequisite: CSE 221 which may be taken concurrently. Ammar, Greenshields, Ting
Introduction to computer networks and data communications. Network types, components and topology, protocol architecture, routing algorithms, and performance. Case studies including LAN and other architectures.

252. Digital Systems Design
(Also offered as EE 252.) Either semester. Three credits. Prerequisite: CSE 243 or both CSE 240 and CSE 241. Not open to students who have credit for EE 252. Greenshields
Design and evaluation of control and data structures for digital systems. Hardware design languages are used to describe and design alternative register transfer level architectures and control units with a micro-programming emphasis. Consideration of computer architecture, memories, digital interfacing timing and synchronization, and microprocessor systems.

254. Introduction to Discrete Structures
Either semester. Three credits. Prerequisite: CSE 111 or 124C or 130C. Not open for credit to students who have passed MATH 214Q. Open to sophomores. Selfridge
Mathematical methods for characterizing and analyzing discrete systems. Modern algebraic concepts, logic theory, set theory, grammars and formal languages, and graph theory. Application to the analysis of computer systems and computational structures.

255. Principles of Data Bases
Either semester. Three credits. Prerequisite: CSE 254 or MATH 214. Required preparation: CSE 230. Shin
Fundamentals of data base design and data indexing techniques. Hierarchical, network, and relational data models. Data base design theory. Query languages, their implementation and optimization. Data base security and concurrent data base operations.

257. Numerical Methods in Scientific Computation
(Also offered as EE 257.) Either semester. Three credits. Prerequisite: Either CSE 110C, 123C or 130C or ENGR 150C, and MATH 210Q and 211Q. Not open for credit to students who have passed EE 257. Peters, Roulier
Introduction to the numerical algorithms fundamental to scientific computation. Equation solving, function approximation, integration, difference and differential equations, special computer techniques. Emphasis is placed on efficient use of computers to optimize speed and accuracy in numerical computations. Extensive digital computer usage for algorithm verification.

258. Operating Systems
Either semester. Three credits. Prerequisite: CSE 230 and either CSE 201 or 241 or 243. Required preparation: CSE. Demurjian, Santos
Introduction to the theory, design, and implementation of software systems to support the management of computing resources. Topics include the synchronization of concurrent processes, memory management, processor management, scheduling, device management, file systems, and protection.

259. Algorithms and Complexity
Either semester. Three credits. Two class periods and two hours laboratory. Prerequisite: CSE 111, or 124C or 130C. Recommended preparation: CSE 254 or MATH 214. Peters, Selfridge
Theoretical aspects of computer science. Equivalent methods for solving problems, the role of mathematical induction, graph algorithms, complexity theory, computability, use of standard algorithmic techniques such as divide-and-conquer. Investigation of novel examples from fields such as graphics, computational geometry, and artificial intelligence. Emphasis in lab will be on analysis of supplied software examples, although some original software development will also occur.

261. Digital Hardware Laboratory
The design of microcomputer systems, including both hardware and software, for solving application problems. Hardware and software design and implementation techniques for interfacing microcomputers to other systems. Use of modern microcomputer software/hardware development facilities. Projects to design and apply microcomputer systems.

268. Microprocessor Laboratory
First semester. Three credits. One 4-hour laboratory period. Prerequisite: Announced separately for each course. With a change in content this course may be repeated for credit.
Design and implementation of complex software and/or hardware systems to solve problems posed by either student groups or the instructor.

269. Computer Science Design Laboratory
Either semester. Three credits. One 4-hour laboratory period. Prerequisite: Announced separately for each course. With a change in content this course may be repeated for credit.

Semester by arrangement. Three credits. Prerequisite: CSE 111 or 124C or 130C, and either MATH 227Q or 215Q and MATH 210Q. Not open for credit to students who have passed MATH 255. Peters, Roulier
Representation of two- and three-dimensional data, internal representation of data structures, transformations, mapping of data to graphics screen, graphics hardware. Programming projects are assigned.

278. Social, Ethical and Professional Issues in Computer Science and Engineering
Either semester. Three credits. Prerequisite: CSE 111 or 124C or 130C. Engel
Study of areas in which computer science interacts with ethical issues, and issues of public policy. Topics of professional growth, development, and responsibility. Practice in the analysis of complex issues brought about by modern technology.

280. Digital Design Laboratory
(Also offered as EE 280.) Either semester. Three credits. Four hours of laboratory. Prerequisite: CSE/EE 252 which may be taken concurrently. Not open for credit to students who have credit for EE 280.
Digital designing with PLA and FPGA, A/D and
Elements of costume, lighting, management and stagecraft with application to departmental productions.

108. Fundamentals of Theatrical Design
Either semester. Three credits. Saternow
Introduction to theories of theatrical design and their application.

110. Introduction to Film
Either semester. Three credits. Two class periods and one 2-hour laboratory period.
A basic study of film as both a means of communication and as an art form.

120. Production of the Speaking Voice
Either semester. Three credits. Stern
Study and practice in the development of an expressive, injury-free speaking voice capable of filling most performance spaces without amplification. Students concentrate on breathing technique, throat relaxation, resonance enhancement, and the use of variety in pitch and speaking rate. The course also integrates these technical voice skills with the principles of the inner acting process.

130. History of Drama I
First semester. Three credits. Not open for credit to students who have passed DRAM 180. McDermott
Dramatic literature and theatre history from Classical Greece through the Spanish Golden Age, including an examination of non-western theatre traditions, especially Japanese.

131. History of Drama II
Second semester. Three credits. Required preparation: DRAM 130. Not open for credit to students who have passed DRAM 181. McDermott, Molette
Dramatic literature and theatre history from the French Renaissance to Contemporary Theatre, including an examination of non-western theatre traditions, especially Chinese.

141. Oral Interpretation
Either semester. Three credits. Krasser
An intensive study of background and thought content of literary material and the development of techniques of oral interpretation.

143-144. Introduction to Acting
Both semesters. Three credits each semester. Concurrent enrollment in DRAM 149-150 required for all acting majors.
First semester: Basic acting techniques, including improvisation and the use of the stage environment. Second semester: continuation of basic techniques with emphasis on the presentation of scenes from contemporary plays.

149. Introduction to Movement for the Actor I
First semester. Three credits. Three 2-hour studio periods. Sabatine
Conditioning the body to increase stretch, strength, flexibility, and sensitivity. Exploration of movement concepts in space, time and energy values, and mind body and environment relationships.

150. Introduction to Movement for the Actor II
Second semester. Three credits. Three 2-hour studio periods. Sabatine
Continuation of Dramatic Arts 149. Emphasis on the organization of movement expression using essence theory of emotion, intentions, gestures and physical characterization through movement.

153. Theatre Jazz Dance I
Either semester. Three credits. Three 2-hour studio periods.
Basic techniques, styles, and composition of jazz dance. Emphasis placed on technique.

154. Theatre Jazz Dance II
Continuation of Dramatic Arts 153.

163-164. Introduction to Directing
Both semesters. Three credits each semester. Required preparation: DRAM 143.
First semester: Emphasis on theory and play analysis from the director’s point of view. Second semester: Emphasis on practical staging experience, including casting techniques and rehearsal and performance methods.

180. Masterpieces of the Drama: Aeschylus to Shakespeare
Either semester. Three credits. Krasser
A study of masterpieces of Greek, Roman and Elizabethan drama with emphasis on analysis of form and content and attention to staging conventions.

181. Masterpieces of the Drama: Molière to the Present
Either semester. Three credits. McDonald
A study of masterpieces of French 17th Century; English Restoration and 18th Century; European, English, and Japanese 19th Century; and European, English, African, and American 20th Century drama. Emphasis on analysis of form and content and attention to staging conventions.

181W. Masterpieces of the Drama: Molière to the Present
Prerequisite: ENGL 105; required preparation: ENGL 109, which may be taken concurrently.

191. Performance Techniques in Ethnic Arts
Either or both semesters. Credits and hours by arrangement. May be repeated for credit with a change in course content. Open only with consent of instructor.
Performance study and practice in selected areas of ethnic and minority dramatic arts. Topics to be alternated may include Afro-American dance, Black Heritage theatre, Indian dance.

200. Scene Construction
First semester. Three credits. Required preparation: DRAM 107 (Stagecraft). McCaw
Basic techniques of constructing two dimensional and three dimensional scenery.

201. Rigging
Second semester. Three credits. Required preparation: DRAM 107 (Stagecraft). McCaw
Rigging systems and the basic techniques for flying scenery, with an emphasis on rigging safety.

203. Stage Management for the Theatre
A study of the roles of the stage manager and assistant stage manager.

205. Scenographic Techniques for the Theatre
Either semester. Three credits. Two 3-hour laboratory periods. Required preparation: DRAM 107 (Stagecraft), 108, and consent of instructor. McCaw
A laboratory course for designers and technicians in the techniques of preparing a scene design for production in a shop. Drafting techniques, sheet layout, conventions and symbols are stressed.

206. CAD for the Theatre
Either semester. Two 3-hour laboratory periods. Required preparation: DRAM 205 and consent of instructor.
Computer Aided Drafting techniques for theatrical applications. Use of design software for creating
various 2-D plans, including light plots, set designs and technical shop drawings.

207C-208. Lighting for the Theatre
Both semesters. Three credits each semester. Two class periods and one 2-hour laboratory period. Required preparation: DRAM 107 (Lighting), 108. Franklin Stern

209 Principles of Design and Rendering
Either semester. Three credits. Two class periods and one 2-hour studio period. Required preparation: Drama 108 or consent of instructor. Crow
Composition and color theory for designers as well as an exploration of graphic techniques in mixed media for expression of design ideas.

211-212. Scene Design
Both semesters. Three credits each semester. Two class periods and one 2-hour laboratory period. Required preparation: DRAM 108 and consent of instructor. Saternow

213. Costume History
Either semester. Three credits. Two class periods and one 2-hour studio period. Crow
A slide survey class covering the origins and development of dress to the present day. Specifically African, Middle Eastern, an Euro-Centric dress, along with the societies and manners which created fashion.

214. Costume History and Design
Either semester. Three credits. Two class periods and one 2-hour studio period. Recommended preparation: DRAM 108 or consent of instructor. Crow
An introductory class centering on the designer's approach to the text, the creation of the designed look for the characters in the play, and the process of how to realize the costumes.

215. Sound for the Theatre
Either semester. Three credits. Art of sound design for the theatre. Organizing and creating sound for production.

216C. Computer Rendering
Either semester. Three credits. Two class periods and one 2-hour studio period. Required preparation: DRAM 108 or consent of instructor. Crow
Computer rendering for the theatre in 2-D and 3-D format.

219. Advertising, Publicity, and Promotion in the Dramatic Arts
Either semester. Three credits. Open only with consent of instructor. An introduction to the basic techniques of advertising copy, news releases, and feature stories.

220. Voice and Diction I
First semester. Three credits. Required preparation: DRAM 120 and concurrent enrollment in DRAM 268. Stern
Study and practice in the continued development of breathing, phonation and resonance skills, with added attention being paid to non-regional pronunciation (including the standard sounds and symbols of the International Phonetic Alphabet), articulation (of colloquial and classical diction styles), and phrasing.

222. Voice and Diction II
Required preparation: DRAM 220 and concurrent enrollment in DRAM 269. Stern
Continued exploration of voice production and elevated diction skills required for acting in classical and period styles. Particular attention is given to textual analysis, verse performance, and the specialized voice techniques required for highly emotional scenes.

226. Creative Dramatics
Either semester. Three credits. Offered at the Avery Point Campus. Jarmey
Principles and procedures of dramatic play, characterization and improvisation. Participation in program development for elementary and secondary school children.

230. Women in Theatre
Either semester. Three credits. Open to sophomores. McDermott
A study of theatre examining the changing depiction of women in drama and the increasing participation of women in all areas of theatrical activity. Women's advancement in western and oriental theatre will be surveyed as a background for focusing on plays written in the 20th century.

230W. Women in Theatre
Either semester. Three credits. Open to sophomores. Molette
The significant developments in African American theatre and its antecedents and an examination of selected play scripts that exemplify those developments.

231. African-American Theatre
Either semester. Three credits. Open to sophomores. Sater
The study and practice of those dialects and accents appropriate to characters from African, Middle Eastern, and African American cultures. Emphasis on the contributions of individuals who have changed the character of American theatre.

232. African-American History
Either semester. Three credits. Open to sophomores. Sabatine
The study and practice of those dialects and accents appropriate to characters from African, Middle Eastern, and African American cultures. Emphasis on the contributions of individuals who have changed the character of American theatre.

233. The American Film
First semester. Three credits. Three 2-hour studio periods. Open to sophomores. Sabatine
The study and practice of those dialects and accents appropriate to characters from African, Middle Eastern, and African American cultures. Emphasis on the contributions of individuals who have changed the character of American theatre.

234. Acting Technique II
Second semester. Three credits. Three 2-hour studio periods. Required preparation: DRAM 243 and consent of instructor. Open to sophomores. McDonald
A continuation of the study and practice of techniques utilized in the performance of modern realists.

247-248. Puppetry
Both semesters. Three credits each semester. May be repeated for credit with change in course content to a maximum of 12 credits. Required preparation: DRAM 108 or consent of instructor. Open to sophomores. Roccoberton
First semester: Rod puppetry or Shadow theatre. Second semester: Hand puppetry or Mask theatre. Topics to alternate on a two-year rotation.

249. Acting for the Media
Either semester. Credits and hours by arrangement. Open only with consent of instructor. Krasser
Study and practice in the principles and techniques of television performance and acting before the camera.

250. Musical Theatre Dance
First semester. Three credits. Three 2-hour studio periods. Required preparation: DRAM 154 or consent of instructor. May be repeated for credit with a change in course content to a maximum of 6 credits. Sabatine
Tap, free style, folk and social dance forms used in musical theatre. Integration of dance with song.

251. The American Film
First semester. Three credits. Two class periods and one 2-hour laboratory period. May be repeated for credit with a change in course content to a maximum of 6 credits.
A critical analysis of the American fiction film.

252. World Film
Second semester. Three credits. Two class periods and one 2-hour laboratory period. May be repeated for credit with a change in course content to a maximum of 6 credits.
A critical analysis of representative world films.

257. Fundamentals of Television I
First semester. Three credits. Two 3-hour laboratory periods. Open only with consent of instructor.

258. Fundamentals of Television II
Second semester. Three credits. Two 3-hour laboratory periods. Required preparation: DRAM 257 and consent of instructor.

259. Practicum in Dramatic Arts
Either or both semesters. Credits and hours by arrangement. Open only with consent of instructor. Open to sophomores.
Practical work in all areas of dramatic arts.

265. Stage Dialects
Either semester. Two credits. One class period and one 2-hour lab. Required preparation: DRAM 220 or consent of instructor. Stern
The study and practice of those dialects and accents most frequently required by American actors. Contents include, but are not limited to, Standard British, and a range of New York City and American Southern patterns.

266. Acting Technique III
First semester. Three credits. Three 2-hour studio periods. Required preparation: DRAM 244 and consent of instructor. Concurrent enrollment in DRAM 220 and DRAM 239 required. Krasser, McDonald

† Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).
299. Independent Study
Either or both semesters. Credits and hours by arrangement. May be repeated for credit with a change in course content. Performance study and practice in selected areas of dramatic arts. Topics to be alternated.

298. Seminar
Either or both semesters. Credits and hours by arrangement. Open only with consent of instructor. May be repeated for credit.

297. Acting Technique VI

296. Special Topics
Either semester. Three credits. May be repeated for credit, with change of topic. Economics of automation, the state of current theory. Mainly advanced studies in the history of economic thought, the philosophy and methodology of economics, or alternative economic theories.

295. Environmental Theatre
Performance study and practice in selected areas of environmental theatre. Personnel, budgeting, unions and theatre in the United States, including community, university and regional theatres, and “on,” “off,” and “off-off” Broadway. Personnel, budgeting, unions and audience development will be covered.

294. Trends in Contemporary Puppet Theatre
Either semester. Three credits. Additional project required for graduate credit. A study of the major trends in drama, design styles and production of the puppet theatre in the western world today.

293. Foreign Study
Either or both semesters. Credits and hours by arrangement. May be repeated for credit. Consent of Department head required, normally to be granted prior to the student’s departure. May count toward the major with consent of the advisor.

292. Performance Techniques
Either or both semesters. Credits and hours by arrangement. Open only with consent of instructor. May be repeated for credit with a change in course content.

291. Environmental Theatre
Either or both semesters. Credits and hours by arrangement. May be repeated for credit. Consent of Department head required, normally to be granted prior to the student’s departure. May count toward the major with consent of the advisor.

290. Topics in Economic History and Thought
Either semester. Three credits. Prerequisite: ECON 111 and 112, or 113. Not open for credit to students who have passed ECON 111. May not be taken concurrently with ECON 111 or 112. Same core of principles as ECON 111 or 112. Economic evolution of Europe from feudal times to the present, emphasizing the modern period: the rise of commerce, industry, and banking; the growth of population and the labor force; the changing position of agriculture; business fluctuations; and forms of economic organization.

289. Theatre Administration and Organization
Either semester. Three credits. A survey of the organizational structure of the theatre in the United States, including community, university and regional theatres, and “on,” “off,” and “off-off” Broadway. Personnel, budgeting, unions and audience development will be covered.

288. Theatre Administration and Organization
Either semester. Three credits. A survey of the organizational structure of the theatre in the United States, including community, university and regional theatres, and “on,” “off,” and “off-off” Broadway. Personnel, budgeting, unions and audience development will be covered.

287. Advanced Puppetry Techniques I
First semester. Three credits. Two 3-hour laboratory periods. May be repeated for credit with change in course content to a maximum of six credits. Required preparation: DRAM 248 or consent of instructor. Roccoberton Laboratory practice in advanced production techniques or paper sculpture for the puppet theatre.

286. Trends in the Contemporary Puppet Theatre
Either semester. Three credits. Additional project required for graduate credit. Roccoberton A study of the major trends in drama, design styles and production of the puppet theatre in the western world today.

285. Trends in the Contemporary Puppet Theatre
Either semester. Three credits. Additional project required for graduate credit. Roccoberton A study of the major trends in drama, design styles and production of the puppet theatre in the western world today.

284. Trends in Contemporary Theatre
Either semester. Three credits. Open to sophomores. A study of the major trends in drama and theatrical production of the western world today.

283. Theatre Administration and Organization
Either semester. Three credits. A survey of the organizational structure of the theatre in the United States, including community, university and regional theatres, and “on,” “off,” and “off-off” Broadway. Personnel, budgeting, unions and audience development will be covered.

282. Trends in Contemporary Theatre
Either semester. Three credits. Open to sophomores. A study of the major trends in drama and theatrical production of the western world today.

281. Performance Techniques
Either or both semesters. Credits and hours by arrangement. Open only with consent of instructor. May be repeated for credit with a change in course content.

280. Film Writing
Both semesters. Three credits each semester. Open only with consent of instructor. Theoretical and practical work in the content and form of the fiction scenario.

279. Advanced Puppetry Techniques II
Second semester. Three credits. Two 3-hour laboratory periods. May be repeated for credit with change in course content to a maximum of six credits. Required preparation: DRAM 248 or consent of instructor. Roccoberton Advanced puppetry production techniques for television or laboratory practice in materials techniques.

278. Acting Technique V
First semester. Three credits. Three 2-hour studio periods. Required preparation: DRAM 248 and consent of instructor. The study and practice of acting techniques utilized in a range of comic styles.

277. Acting Technique VI

276. Acting Technique V
First semester. Three credits. Three 2-hour studio periods. Required preparation: DRAM 268 and consent of instructor. The analysis of the basic techniques in playwriting, and the reading and criticism of the students’ works in progress. Scripts of outstanding merit may be produced in the Studio or Mobius Theatres.

275. Film Writing
Both semesters. Three credits each semester. Open only with consent of instructor. The study and practice of acting techniques utilized in a range of comic styles.

274. Film Writing
Both semesters. Three credits each semester. Open only with consent of instructor. The study and practice of acting techniques utilized in a range of comic styles.

112. Principles of Economics (Intensive)
Either semester. Four credits. Four class periods. Not open for credit to students who have passed ECON 111 or 112. May not be taken concurrently with ECON 111 or 112. 

111. Principles of Macroeconomics
Either semester. Three credits. May be taken before or after ECON 112. Not open for credit to students who have passed ECON 111. May not be taken concurrently with ECON 111.

100. Critical Issues in Economics
First semester. Three credits. Not open for credit to students who have passed ECON 111, 112, or 113. 

Economics (ECON)

Head of Department: Professor Stephen M. Miller
Department Office: Room 328, Monteith Building

110. Critical Issues in Economics
First semester. Three credits. Not open for credit to students who have passed ECON 111, 112, or 113. 

111. Principles of Macroeconomics
Either semester. Three credits. May be taken before or after ECON 112. Not open for credit to students who have passed ECON 111. May not be taken concurrently with ECON 113. 

112. Principles of Microeconomics
Either semester. Three credits. May be taken before or after ECON 111. Not open for credit to students who have passed ECON 111. May not be taken concurrently with ECON 113.

The evolution of economic ideas significant to their own times and to the state of current theory. Mainly nineteenth and twentieth century thinkers.
206. Philosophy and Economics
(Also offered as Philosophy 245.) Either semester. Three credits. Required preparation: ECON 112 or 113.
An examination of the normative assumptions and implications of modern economics (for example, the connections between Classical Utilitarianism and Welfare Economics). Attention to methodological controversies in contemporary economic theory.

207. Beyond Self-Interest
Either semester. Three credits. Required preparation: ECON 112 or 113. Minkler
A contrast to the assumptions, values, methodology, and philosophical underpinnings of mainstream economic analysis. Altruism, role of social norms and culture, importance of work, moral assessment of economic systems, feminist and ecological economics.

207W. Beyond Self-Interest

208. Political Economy of Capitalism
Either semester. Three credits. Recommended preparation: ECON 111 or 112, or 113. Sazama
Application of socialist economic theory to structural issues of capitalist societies: distribution of power; causes of poverty and discrimination; military spending; stagnation and growth.

212V. Empirical Methods in Economics I (Q,C)
Either semester. Three credits. Two class periods and one 2-hour laboratory period. Required preparation: ECON 111 and 112, or 113; MATH 106Q or 110Q or 113Q or 115Q or 113Q; and STAT 100W. Open to sophomores. A course advised for all major students in economics. Couch, Lott, Ray
Introduction to the empirical testing of economic theories. Student projects testing simple economic models.

212Z. Empirical Methods in Economics II (W,Q,C)
Second semester. Three credits. Prerequisite: ECON 212V.
Analysis of economic time series, estimation of single- and simultaneous-equation economic models, and statistical decision theory.

214Q. Mathematical Economics
Either semester. Three credits. Required preparation: ECON 111 and 112, or 113; MATH 106Q or 110Q or 113Q or 115Q or 113Q; and STAT 100V. Open to sophomores. A course advised for all major students in economics. Couch, Lott, Ray
Application of mathematical techniques to economic problems. Methods studied: set theory, linear algebra, equilibrium analysis, unconstrained and constrained optimization, comparative statics, and linear programming.

216V. Operations Research (Q,C)
First semester. Three credits. Two 75-minute classes per week. Seven of the classes will be held at the computer lab. Required preparation: ECON 111 and 112 or 113. Sacks
Extensive use of computer spreadsheets to find efficient solutions to problems faced by managers in both the public and private sectors. Optimization of input and output mixes, of delivery routes, and communication networks.

218. Intermediate Microeconomic Theory
Either semester. Three credits. Prerequisite: ECON 112 or 113. Recommended preparation: ECON 111. Open to sophomores. ECON 218 or 218Q is required of all economics majors. Cosgel, Heffley, Kimenyi, Lott, Miceli, Minkler, Randolph, Ray, Sacks, Segerson
Intermediate microeconomic theory, covering demand and supply, exchange and production, pricing, and welfare economics.

218Q. Intermediate Microeconomic Theory
Prerequisite: ECON 112 or 113. Required preparation: MATH 106Q or 110Q or 113Q or 115Q or 113Q. Recommended preparation: ECON 111. Open to sophomores. ECON 218 or 218Q is required for all economics majors. Randolph, Segerson
Applications of mathematical techniques to intermediate microeconomic theory.

219. Intermediate Macroeconomic Theory
Either semester. Three credits. Prerequisite: ECON 111 or 113. Recommended preparation: ECON 112. Open to sophomores. ECON 219 or 219Q is required of all economics majors. Not open for credit to students who have passed ECON 229 or 219Q. Akhing, Allen, Cunningham, Morand
Intermediate macroeconomic theory, covering national income accounting; the determination of aggregate output, employment and price levels; elements of business cycles and economic growth.

219Q. Intermediate Macroeconomic Theory
Prerequisite: ECON 111 or 113. Recommended preparation: MATH 106Q or 110Q or 113Q or 115Q or 113Q. Recommended preparation: ECON 112. Open to sophomores. ECON 219 or 219Q is required for all economics majors. Akhing, Cunningham, Morand
Applications of mathematical techniques to macroeconomic theory.

230. Money and Banking
Either semester. Three credits. Required preparation: ECON 111 and 112, or 113. (112 may be taken concurrently.) Open to sophomores. Akhing, Cunningham, Lott, Miller
The nature of money, the origins of monetary standards and systems, the development and operation of commercial banking, the Federal Reserve System, and international monetary agencies.

231. Special Problems in Money and Banking
Second semester. Three credits. Prerequisite: ECON 230. Akhing
Emphasis on public policy: commercial bank regulations; the relation of liquidity to economic fluctuations; government lending agencies; and central bank policies and credit control.

242. International Trade
Economic basis of international trade, trade policies, and international economic organizations.

242W. International Trade

243. International Finance
Payments and financing of international trade: foreign exchange markets, the balance of payments, capital flows, and international monetary arrangements.

244. Transitional Economies of Russia and East Europe
Either semester. Three credits. Required preparation: ECON 111 and 212, or 113. Allen
Economic transition of these formerly socialist economies into capitalist, market economies. Problems of macroeconomic imbalance, economic distortions, shortages and repressed inflation, and an increasing price liberalization, privatization, restructuring, currency convertibility, and building legal and financial institutions.

247. Economic Development
First semester. Three credits. Required preparation: ECON 111 and 112, or 113. Randolph, Segerson
Economics of problems facing developing nations: theories of development, and strategies and policies to promote economic development.

247W. Economic Development

253. Public Finance
Government expenditures and tax policies; theories of public choice, size and mix of government budgets, alternative tax systems, and tax reform.

253W. Public Finance

257. Economics of Poverty
First semester. Three credits. Required preparation: ECON 111 and 112, or 113. Kimenyi
Analysis of poverty and income maintenance programs; theories of income distribution and comparison of public policies in the U.S. and other countries.

258. Contemporary Problems in Economics
Either semester. Three credits. Required preparation: ECON 218 and 219 (one of which may be taken concurrently). Wright
Current issues of government economic policy: primarily microeconomic: energy, income maintenance, labor markets for minorities and women, government regulation, health care, and others.

258W. Contemporary Problems in Economics

259. Urban and Regional Economics
(Also offered as Urban Studies 259.) Second semester. Three credits. Required preparation: ECON 112 or 113. Recommended preparation: ECON 111. Not open for credit to students who have passed URBN 259. Heffley, Miceli
Economic problems of cities and regions: urban markets for land, labor, and housing; location decisions of businesses and households; metropolitan transportation problems; urban/suburban fiscal relations; urban and regional environmental quality, and the economics of crime.

259W. Urban and Regional Economics

261. Health Economics
Either semester. Three credits. Required preparation: ECON 112 or 113. Heffley
Economic analysis of the health sector: organization and performance of health care delivery systems; economic behavior of patients and providers; markets for health services; health-care finance and insurance; health-care policy; and cost-benefit analysis of health-care programs.

264. Government and Industry
Second semester. Three credits. Required preparation: ECON 112 or 113. Langlois, Sacks
Relations between government and business. Public policies enforcing, supplementing, or replacing competition in particular markets, studies of selected industries and legal cases.

267. Organization of Industry
First semester. Three credits. Required preparation: ECON 112 or 113. Recommended preparation: ECON 218. Langlois, Minkler
The nature of competition and economic organization. Competitive effects of business practices, and their influence on price, production, and technological change.
286. Economics of the Law
Second semester. Three credits. Required preparation: ECON 112 or 113. Recommended preparation: ECON 111 and 218. Langlois, Miceli
The law as an economic institution. Primary focus on the Common Law, property, tort, and contract. Applications to pollution control, land-use, hazardous wastes, product liability, and worker safety. Ethical as well as economic approaches to the law.

274. Labor Economics
Either semester. Three credits. Required preparation: ECON 112 or 113. Barth
Economics of labor: human capital theory, discrimination, unemployment, manpower policy, and trade unions.

274W. Labor Economics

275. Theory of Labor Markets
Either semester. Three credits. Required preparation: ECON 112 or 113. Barth
Theoretical analysis of labor markets: labor supply and demand; wage differentials; human capital; and the inflation-unemployment tradeoff.

276. Labor Legislation
Second semester. Three credits. Required preparation: ECON 112 or 113. Barth
Legal status of labor, unorganized and organized, in legislation and court decisions. Emphasis on the labor contract, bargaining procedures, and union and employer tactics. Also, legislation dealing with wages, hours, child labor, old-age benefits, and accident and unemployment compensation.

279. Women and Minorities in the Labor Market
Either semester. Three credits. Required preparation: ECON 111 and 112, or 113. Kimenyi, Randolph
Issues and problems confronting women and minorities in the workplace, using economic theory, institutional analysis, and empirical investigation. Historical background, allocation of time, discrimination, earnings determination, occupational structure, labor unions, and public policy.

286W. Honors Seminar
Second semester. Three credits. Consent of instructor required, with preference given to Honors and Distinction students and Economics Scholars. Required preparation: ECON 218 and 219 or 308 and 309 (one may be concurrent). Segevson, Wright
Preparation for (1) senior thesis, or (2) Distinction comprehensive exam. 50%: 5-6 presentations of faculty research, with short papers by students. 50%: (a) major term project (Honors or Economics Scholars), or (b) extensive annotated bibliography for comprehensive exam (Distinction). Intensive drill on expository writing, especially organization, clarity, and accuracy.

289W. Senior Thesis in Economics
Either semester. Three credits. Hours by arrangement. Open only with consent of instructor. Required preparation: ECON 286W or consent of the Department Honors Advisor.

293. Foreign Study
Either or both semesters. Credits and hours by arrangement. May be repeated for credit. Consent of Department Head required, prior to the student’s departure. May count toward the major with consent of the advisor. Special topics taken in a foreign study program.

294. Internship – Field Study
Either semester. Two credits. Hours by arrangement. Required preparation: nine credits of 200-level economics courses (six of which may be concurrent). Consent of instructor is required. Students must be at least 6th-semester and have a minimum TGPA of 2.25 or a minimum of 2.5 in 200-level economic courses. Students must secure a satisfactory intern position before the end of the second week of the semester enrolled in the course. They should begin consultation with the instructor several months in advance. Grade of S (satisfactory) or U (unsatisfactory). Does not count toward the economic major. Must be taken concurrently with ECON 295; no credit will be given for one course without the other. Sazama
Supervised field work, of six-eight hours per week, relevant to some area of economics, with a business firm, government agency or non-profit organization. Evaluation by the field supervisor and by the instructor (based on a detailed written report submitted by the student).

295. Internship – Research Paper
Either semester. One credit. Hours by arrangement. Required preparation: nine credits of 200-level economic courses (six of which may be concurrent). Consent of instructor is required. Students must be at least 6th-semester and have a minimum TGPA of 2.25 or a minimum of 2.5 in 200-level ECON courses. Must be taken concurrently with ECON 294; no credit will be given for one course without the other. Sazama
Research paper of 3,000-4,000 words on approved topic related to the internship field study.

297. Variable Topics
Either semester. Three credits. With a change in topic, may be repeated for credit. Prerequisites, required preparation, and recommended preparation vary.

298. Special Topics
Either semester. Credits and hours by arrangement. With a change in topic, this course may be repeated for credit. Prerequisites, required preparation, recommended preparation vary.

299. Independent Study
Either or both semesters. Credits and hours by arrangement. Open only to seniors with consent of instructor. A student may receive credit for no more than 6 credits of ECON 299.

294. Seminar/Clinic: The Student as Learner
First semester. Three credits. Required of undergraduate students in the teacher preparation program leading to teacher certification who are concurrently enrolled in EPSY 250, EDCI 230 and EPSY 207. Open only to students in the Integrated Bachelor’s/Master’s Teacher Preparation Program.

295. Seminar/Clinic: The Student in the School Context
Second semester. Three credits. Required of undergraduate students in the teacher preparation program leading to teacher certification who are concurrently enrolled in EPSY 251, EDCI 231. Open only to students in the Integrated Bachelor’s/Master’s Teacher Preparation Program.

296. Seminar/Clinic: Methods of Teaching
First semester. Three credits. Required of undergraduate students in the teacher preparation program leading to teacher certification who are concurrently enrolled in EPSY 253, EDCI 232 and EPSY 208. Prerequisite: EGEN 295. Open only to students in the Integrated Bachelor’s/Master’s Teacher Preparation Program.

297. Seminar/Clinic: Analysis of Teaching
Second semester. Three credits. Required of undergraduate students in the teacher preparation program leading to teacher certification who are concurrently enrolled in either EDCI 276, EDCI 277, EPSY 277, or EPSY 278. Prerequisite: EGEN 296. Open only to students in the Integrated Bachelor’s/Master’s Teacher Preparation Program.

298. Honors Seminar
Either semester. Three credits. Restrictions: Students must be accepted by the School of Education Honors Committee as candidates for Degrees with Distinction, Honors Scholars, or University Scholars. Can be repeated for credit.

299. Independent Study: Honors Thesis Preparation
Either semester. Three credits. Restrictions: Students must be accepted by the School of Education Honors Committee as candidates for Degrees with Distinction, Honors Scholars, or University Scholars. Can be repeated for credit.

Education: Curriculum and Instruction (EDCI)

Head of Department: Professor Thomas P. Weinland
Department Office: Room 336, Gentry Building

For major requirements, see the School of Education section of this Catalog.

294. Introduction to Bilingual-Bicultural Education
Semester by arrangement. Three credits. Diaz, Leach, Minaya-Rove, Reagan
This course deals with cultural-historical background and processes of establishment and implementation of bilingual-bicultural education programs.

211. Curriculum and Teaching of Reading
Semester and hours by arrangement. Variable credits, not to exceed three. Prerequisite: EGEN 294 and EGEN 295 or consent of instructor. Doyle, Irwin, Meagher, M. Weinland
An introduction to the principles and practices of teaching reading in the elementary school. Field experience may be included.
212. **Introduction to Outdoor Education**  
Semester and hours by arrangement. Three credits. **Goodkind.**  
An introduction to the elements and philosophy of outdoor education. The development of knowledge, understanding and appreciation of educational values inherent in the natural environment.

220. **Teaching the Language Arts in the Elementary School**  
Both semesters. Three credits. Open to undergraduate elementary education majors and elementary education certification students. **Doyle, Irwin, Meagher.**  
A study of current theory and approaches to teaching the language arts effectively by connecting the teaching of speaking, listening, reading, and writing and by integrating this instruction with children’s literature and content learning. Field experiences may be included.

221. **Teaching Reading and Writing in the Elementary School**  
Both semesters. Three credits. Open to elementary education majors and elementary education certification students. **Doyle, Irwin, Meagher, M. Weinland.**  
An Introduction to the teaching of reading and writing in the elementary school. Field experiences may be included.

222. **Teaching Mathematics in the Elementary School**  
Both semesters. One credit. Open to undergraduate elementary education majors and elementary education certification students. **DeFranco.**  
A study of current approaches to teaching and learning school mathematics. Opportunities will be provided for participants to develop an awareness and knowledge of the Standards for Teaching School Mathematics (NCTM, 1990).

223. **Curriculum and Teaching of Elementary School Science**  
First semester. One credit. Open only to Elementary Education majors. **Lonnig.**  
A study of curriculum materials, laboratory experiences and teaching techniques in science.

224. **Curriculum and Teaching of Elementary School Social Studies**  
Either semester. One credit. Open only to Elementary Education majors. **T. Weinland.**  
A study of the organization of learning experiences and teaching methods emphasizing the social sciences as the foundation of the social studies.

225. **Teaching in the Kindergarten**  
Semester and hours by arrangement. Three credits. **Prerequisite: EPSY 221 which may be taken concurrently, and HDFR 190. Open only with consent of instructor.**  
The organization of learning experience in kindergarten. Field experience may be included.

230. **Foundations of Education: Multiculturalism, Equity, and Excellence**  
(Formerly EDLR 230.) First semester. One credit. **Prerequisite: Admission to the School of Education. Open only to students in the Integrated Bachelor’s/Master’s Teacher Preparation Program. Fowlkes, Weibust**  
Legal and Sociocultural concepts and issues related to multiculturalism and American schools.

231. **Foundations of Education: Social Context of Schooling**  
(Formerly EDLR 231.) Second semester. One credit. **Prerequisite: Admission to the School of Education. Open only to students in the Integrated Bachelor’s/ Master’s Teacher Preparation Program. Fowlkes, Weibust.**  
Social nature of schools: standards, values, socialization, social function of schooling.

232. **Foundations of Education: Philosophical Tools for Teachers**  
(Formerly EDLR 232.) First semester. One credit. **Prerequisite: Admission to the School of Education. Open only to students in the Integrated Bachelor’s/Master’s Teacher Preparation Program. Reagun.**  
Philosophical trends in schooling, and applications of philosophy for prospective teachers.

233. **Social and Community Issues in Education**  
(Formerly EDLR 233.) First semesters. One credit. **Prerequisite: Admission to the School of Education. Open only to students in the Integrated Bachelor’s/Master’s Teacher Preparation Program. Mannebach.**  
Social and community issues, including the effect of alcohol, drugs and tobacco, confronting teachers in contemporary society.

240. **Uses of Microcomputers**  
One credit.  
This course will provide an introduction to the use of microcomputers.

258. **Methods in Elementary School Music**  
Semester by arrangement. Three credits. **Prerequisite: Satisfactory progress in applied music, and consent of instructor.**

262. **Directed Observation and Participation**  
Credits by arrangement. **Prerequisite: Consent of instructor.**  
This course gives prospective teachers an opportunity to see secondary and elementary school teachers and pupils in action, to discuss with supervisors and teachers problems related to work in designated field, and to study school resources from the standpoint of good teaching.

265. **General Teaching Methods**  
First semester. One credit. Open to undergraduate and TCPCG education majors only.  
An introduction and overview of teaching roles and responsibilities. Topics include setting goals and objectives; planning lessons and units; teaching inductively, deductively and interactively; selecting appropriate instructional media; organizing time, space, materials and learners in groups of varying sizes; assigning homework, practice and review; and evaluation techniques.

266-267. **Instruction and Curriculum in the Secondary School**  
Semester and hours by arrangement. **Prerequisite: EGEN 294, EGEN 295 and consent of instructor.**  
A study of the selection and organization of learning experiences, instructional materials and teaching methods. Course activities will include a combination of lecture, seminar, and clinical experiences in local schools.

272. **The Teaching of Reading in Middle and High Schools**  
Semester and hours by arrangement. **Prerequisite: EGEN 294 and EGEN 295. Irwin.**  
Methods of teaching reading to middle and high school students.

273. **Teaching Reading and Writing in the Content Areas**  
Second semester. Two credits. **Prerequisite: Admission to the School of Education. Open only to students in the Integrated Bachelor’s/Master’s Teacher Preparation Program. Spaulding, M. Weinland.**  
A study of the role of reading and writing in the learning of the content areas taught in secondary schools.

276. **Directed Student Teaching**  
Either semester. **Prerequisite: Consent of instructor.**  
Student teaching in secondary schools. Provides opportunity for students to observe teaching, to develop teaching skills through practice, and to engage in other school activities for which elementary teachers are responsible.

277. **Directed Student Teaching**  
Either semester. **Prerequisite: Consent of instructor.**  
Student teaching in secondary schools. Provides opportunity for students to observe teaching, to develop teaching skills through practice, and to engage in other school activities for which elementary teachers are responsible.

278. **Variable Topics**  
Either semester. **Prerequisite: Consent of instructor.**  
May be repeated for credit.

279. **Independent Study for Undergraduates**  
Either semester. **Prerequisite: Consent of instructor.**  
May be repeated for credit.

287. **Tools for Teachers**  
Either semester. **Prerequisite: Consent of instructor.**  
May be repeated for credit.

294. **Effective Teaching in the Content Areas**  
Second semester. Three credits. **Open only to students in the Integrated Bachelor’s/Master’s Teacher Preparation Program. Spaulding, M. Weinland.**  
A study of the role of reading and writing in the learning of the content areas taught in secondary schools.

298. **Variable Topics**  
Either semester. **Prerequisite: Consent of instructor.**  
May be repeated for credit.
298. Variable Topics
   Either semester. Credits and hours by arrangement. Open only with consent of instructor. May be repeated for credit with a change in content.

299. Independent Study for Undergraduates
   Either semester. Credits and hours by arrangement. Prerequisite: Open only to juniors and seniors with appropriate background for the study of education. Students must present the instructor with a problem for investigation. May be repeated for credit with a change in content.
   Designed primarily for qualified students who wish to extend their knowledge in some specialized area.

Education: Educational Psychology (EPSY)

Head of Department: Professor Scott W. Brown
Department Office: Room 210, Gentry Building

For major requirements, see the School of Education section of this Catalog.

206. Introduction to Exceptionality
   Either semester. Three credits. Prerequisite: PSYC 132; PSYC 133 is strongly recommended. Cherkers-Jalkowski, McLean
   This course considers the nature of exceptionalities as well as current policy and programs in the schools and community.

207. Exceptionality I
   First semester. One credit. Open only to students in the Integrated Bachelor’s/Master’s Teacher Preparation Program. Karan, Norlander-Case
   Characteristics of students with exceptionalities.

208. Exceptionality II
   Second semester. One credit. Open only to students in the Integrated Bachelor’s/Master’s Teacher Preparation Program. Campbell, O. Karan, S. Shaw
   Educational programming for learners with special needs.

210. Collaborative Program Planning in Special Education
   First semester. Three credits. Prerequisite: Open to juniors accepted into the IB/M Teacher Preparation Program and majoring in Special Education/Elementary Education or Early Childhood Education. Other students by permission of instructor. Campbell, Karan, McLean, Norlander-Case
   Covers basic knowledge and skills related to collaboration with families, paraprofessionals, other teachers, and professionals from other disciplines, including specialized services for children with disabilities (EG, Health, Assistive Technology, Related Services). Introduction to library and computer resources for school leaders.

211. Instruction of Students with Disabilities
   Second semester. Two credits. Prerequisite: EPSY 212. S. Shaw
   Practical approaches for instructing students with disabilities.

212. Diagnosis, Assessment, and Program Planning
   First semester. Three credits. Prerequisite: Consent of instructor. Madaus, McGuire, Norlander-Case
   Diagnosis of students with special needs, use of test data in planning instruction and report writing.

221. Educational Psychology
   Either semester. Three credits. Prerequisite: PSYC 132; PSYC 133 is recommended. Brown, Kulkowich, Young
   The psychology of learning and teaching, and the study of the nature and development of children and adolescents.

222. Principles of Rehabilitation
   Second semester. Three credits.
   History, philosophy, development, and implementation of rehabilitation processes.

223. Orientation to Rehabilitation Resources
   Either semester. Three credits. Prerequisite: EPSY 222 which may be taken concurrently and consent of instructor.
   Survey, directed observation, and evaluation of facilities and services in the rehabilitation of the disabled.

226. Field Study in Education
   Semester by arrangement. Credits and hours by arrangement. Open only with consent of instructor.
   Active study through visitation and participation in educational and/or rehabilitation environments. Participation in appropriate lectures and seminars is required. Students must be prepared to provide own transportation.

230. Peer Counseling
   Either semester. Three credits. Prerequisite: Consent of instructor.
   This course will focus on the development of those communication skills which are necessary for effective peer and paraprofessional counseling. Several theories of interpersonal communication, experiential learning and self-psychology will also be covered.

240. Technology in Education
   Both semesters. One credit. Open to first year students in the teacher preparation program. Pantambekar, Young
   The use of educational technology in the education profession. Emphasis is placed on computer technology, software evaluation and instructional devices.

250. Learning I
   First semester. One credit. Prerequisite: PSYC 132. Required of undergraduate students in the teacher preparation program leading to teacher certification. Open only to students in the Integrated Bachelor’s/Master’s Teacher Preparation Program. Brown, Reis, Westberg
   Theory and practices of learning.

251. Learning II
   Second semester. One credit. Required of undergraduate students in the teacher preparation program leading to teacher certification. Open only to students in the Integrated Bachelor’s/Master’s Teacher Preparation Program. Brown, Reis, Westberg
   Theory and practices of learning.

252. Assessment of Learning I
   Second semester. One credit. Required of undergraduate students in the teacher preparation program leading to teacher certification. Open only to students in the Integrated Bachelor’s/Master’s Teacher Preparation Program. Archambault, Kulkowich, O’Connell
   Theory and practices of the assessment of learning.

253. Assessment of Learning II
   First semester. One credit. Required of undergraduate students in the teacher preparation program leading to teacher certification. Open only to students in the Integrated Bachelor’s/Master’s Teacher Preparation Program. Archambault, Kulkowich, O’Connell
   Theory and practices of the assessment of learning.

262. Directed Observation and Participation
   Credits by arrangement, not to exceed three. Open only with consent of instructor. Prior to registration, stu-
students must apply for Directed Observation. This course may be taken more than one semester. McGuire
This course gives prospective professionals the opportunity to observe Special Education Teachers and or Rehabilitation Specialists working with the handicapped. Students must be prepared to provide own transportation.

266. Curriculum and Methods for Teaching Students with Disabilities
First semester. Variable credits. May be repeated for up to a total of three credits. Prerequisite EPSY 212 is taken concurrently. Campbell
Emphasis is placed upon the selection and organization of learning experiences and on teaching procedures in special education.

277. Directed Student Teaching: Special Education
Either semester. Credits and hours by arrangement. Prerequisite: An appropriate section of EPSY 266 and consent of instructor. Open to students in the special education program of the School of Education. Application must be made to the Coordinator of Student Teaching for the fall semester prior to March 1; for the spring semester prior to October 1. Campbell, Norlander-Case
Practicum experience with mentally retarded, learning disabled and/or emotionally disturbed students.

298. Variable Topics
Either semester. Credits and hours by arrangement. Open only with consent of instructor. May be repeated for credit.

299. Independent Study for Undergraduates
Either semester. Credits and hours by arrangement. Prerequisite: Open only to juniors and seniors with appropriate background for the study of education. Students must present the instructor with a problem well laid out for investigation. May be repeated for credit with a change in content.
Designated primarily for qualified students who wish to extend their knowledge in some specialized area.

Education: Kinesiology (EKIN)

Head of Department: Professor Carl M. Maresh
Department Office: Room 223, Sports Center

For major requirements, see the School of Education section of this Catalog.

All EKIN 200 level courses are open to EKIN majors only or by consent of instructor.

160. Courses in Lifetime Sports Program
(Formerly offered as ESLE 160.) Either semester. One credit. Two 1-hour laboratory periods. This course may be repeated once for credit. Students majoring in Kinesiology may repeat five times for a total of six credits in six different topics.

A variety of lifetime sports and skills are offered. The teaching of each activity will be geared to individual, dual, and team sport activities.

161. Introduction to Athletic Injuries I
Fall semester. First seven weeks. One credit. Open to all students. Pre-athletic Training students enroll as sophomores. Mansell
A survey class to explore general considerations of recognizing and treating athletic injuries. This section covers tissue healing, rehabilitation, modalities, taping, and bandaging.

163. Introduction to Athletic Injuries III
Spring semester. First seven weeks. One credit. Open to all students. Pre-athletic Training students enroll as sophomores. Mansell
A survey class to explore general considerations of recognizing and treating athletic injuries. This section covers tissue healing, rehabilitation, modalities, taping, and bandaging.

164. Introduction to Athletic Injuries IV
Spring semester. Second seven weeks. One credit. Open to all students. Pre-athletic Training students enroll as sophomores. Mansell
A survey class to explore general considerations of recognizing and treating athletic injuries. This section covers the lower extremity.

201. Camping and Counseling
(Formerly offered as ESLE 201.) Second semester. Three credits. Morrone
The camper, counselor, and cabin group; understanding problems of discipline and morals; maintaining physical and mental health; program organization; camping leadership; camp administration.

203. History, Trends, and Professional Orientation of Recreational Service
(Formerly offered as ESLE 203.) Second semester. Three credits. Shivers
Historical background of the recreational service movement; the significance of recreational service in society; and professional opportunities in the field of recreational service.

204. Principles of Recreational Service
(Formerly offered as ESLE 204.) First semester. Three credits. Servedio
The evolvement of present day recreational service, and basic concepts.

205. Introduction to Therapeutic Recreational Service
(Formerly offered as ESLE 205.) First semester. Three credits. Shivers
Recreational Rehabilitation for special populations. The practice of therapeutic recreational service for clients in treatment centers or communities.

226. Advanced Specialization in Sport Techniques
(Formerly offered as ESLE 226.) Either semester. One credit for each sport form. Must be taken for two credits, not to exceed four credits. Open to EKIN majors only. Staff
Specialization in several individual, dual and team sport forms. Appropriate apparel required.

227. Psychomotor Development Activities
(Formerly offered as ESLE 227.) First semester. Three credits. Garrett
Selection and implementation of physical activities, guided by motor skill development of children.

228. Motor Learning
(Formerly offered as ESLE 228.) First semester. Three credits. Garrett
Learning of motor skills: practice, feedback, motor programs, transfer, memory, retention.

230. Nature and History of Sport
(Formerly offered as ESLE 230.) First semester. Three credits. Hurwitz

Historical perspective of sport: ancient and modern Olympics, physical education, collegiate sports, participation by women.

234. Rehabilitation of Athletic Injuries
(Formerly offered as ESLE 234.) First semester. Three credits. Prerequisite: PNB 264 and 265. Open only to Athletic Training Concentration first year students. Consent of program director required. Casa
The multi-dimensional approaches to rehabilitation of athletic injuries. The restoration of strength, range-of-motion, neuromuscular control, balance, cardiovascular endurance, and other components will be covered as it applies to specific athletic injuries.

235. Emergency Medical Care in Sport and Leisure Activity
(Formerly offered as ESLE 235.) Either semester. Three credits. Open to EKIN majors only.
Identification and evaluation of injuries and illnesses, and appropriate care. Immediate care, follow up procedures, and common medical emergencies.

236. Sport and Society
(Formerly offered as ESLE 236.) Second semester. Three credits. Prerequisite: SOCI 107 or 107W, or SOCI 115 or 115W, Yiannakis
Sport as an institution. Sociological issues involving gender, race, and intercollegiate, professional, and children’s sports.

236W. Sport and Society
(Formerly offered as ESLE 236.) Second semester. Three credits. Tomporowski
Psychological perspectives of sport participation. Motivation, self-confidence, attentional focus, anxiety/ arousal levels.

239. Therapeutic Modalities for Athletic Injuries
Second semester. Three credits. Prerequisite: PHYS 101Q or 121Q, PNB 264 and PNB 265. Open only to Athletic Training Concentration first year students. Consent of program director required.
Techniques and rationale pertaining to treatment and prevention of athletic injuries through the modalities of heat, cold, electricity, massage, ultrason, and others. Also, the pharmacology of therapeutic medications.

248. Physical Systems in Human Performance
(Formerly offered as ESLE 248.) First semester. Three credits. Prerequisite: PNB 264 and PNB 265. Armstrong, Maresh, Van Heest
An organism systems approach to optimal human performance including metabolism, energy transfer, nerve transmission, muscle contraction, endocrine control, and cardiopulmonary physiology.

250. Clinical Instruction for Athletic Trainers I
First semester. Three credits. Prerequisite: PNB 264 and PNB 265. Open only to Athletic Training Concentration first year students. Consent of program director required.
Hands-on instruction/demonstration/practice/implementing of basic emergency procedures, training room procedures, and taping/bracing/wound care procedures. Also, the first of four practical field experiences.

251. Clinical Instruction for Athletic Trainers II
Second semester. Three credits. Prerequisite: PNB 264 and PNB 265. Open only to Athletic Training Concentration first year students. Consent of program director required.
Hands on instruction/demonstration/practice/implementing of basic rehabilitation modalities and conditioning procedures. Also, the second of four practical field experiences.

252. Clinical Instruction for Athletic Trainers III
First semester. Three credits. Prerequisite: PNB 264 and PNB 265. Open only to Athletic Training Concentration first year students. Consent of program director required. 
Casa

Hands on demonstration/practice/implementing of basic evaluation and treatment procedures of specific body regions. Also, the third of four practical field experiences.

253. Current Research in Athletic Training
First semester. Three credits. Prerequisite: PNB 264 and PNB 265. Open only to Athletic Training Concentration second year students. Consent of program director required. 
Casa

Acquaint students with the recent research in the field, the components of conducting and publishing research in the field, and preparation for research endeavors at the graduate level.

254. Athletic Training Administration
Second semester, even years. Three credits. Prerequisite: PNB 264 and PNB 265. Open only to Athletic Training Concentration students. Consent of program director required. 
Casa

Administrative/Management concerns for the athletic trainer. Insurance, budgeting, counseling, facility design, hiring, record keeping, and other issues will be covered.

256. Physical Activity and Health
(Formerly offered as ESLE 256.) First semester. One credit. Required of undergraduate students in the teacher preparation program leading to teacher certification.

Physical fitness concepts that relate to health.

257. Strength and Conditioning for Athletic Trainers
(Formerly offered as ESLE 257.) Second semester. Three credits. Prerequisite: PNB 264 and PNB 265. Open to any EKIN major. Consent of program director required. 
Casa

The focus of this class is the prevention of athletic injuries via the proper implementation of strength and conditioning principles. To include frequency, intensity, recovery, periodization, components of a fitness program, ergogenic aids, and protective bracing.

258. Mechanisms and Adaptations in Sport and Exercise
(Formerly offered as ESLE 258.) Second semester. Four credits. Prerequisite: PNB 264, PNB 265, and either EKIN 248 or consent of instructor. 
Armstrong, Mareesh, Van Heest

An applied approach to the physiological mechanisms and adaptations influencing sport and exercise: optimal nutrition, body composition, exercise training, ergogenic aids, aging, cardiovascular health, and environmental factors.

259. Fitness Management
(Formerly offered as ESLE 259.) Second semester. Three credits. Prerequisite: ESLE 258 or consent of instructor. 
Van Heest

Health fitness programming; a management perspective.

259W. Fitness Management

260. Assessment of Athletic Injuries
(Formerly offered as ESLE 260.) Second semester. Three credits. Prerequisite: PNB 264 and PNB 265. Open only to Athletic Training Concentration first year students. Consent of program director required. 
Casa

Techniques and procedures that athletic trainers use to evaluate injuries to the extremities. Includes history, observation, palpation, special tests, manual muscle testing, blood flow, nerve function, and other injury specific skills.

261. Fitness Testing and Programming
(Formerly offered as ESLE 261.) First semester. Three credits. Prerequisite: EKIN 263.

Physical fitness assessment and individualized fitness programs.

262. Directed Observation and Participation
(Formerly offered as ESLE 262.) Credits by arrangement. Open only with consent of instructor. May be taken more than one semester, but total credits cannot exceed three. Prior to registration, students must apply for Directed Observation and provide for their own transportation.

Mentors include educators, recreationists, athletic trainers, sport professionals.

263. Applied Anatomy and Kinesiology
(Formerly offered as ESLE 263.) Spring semester. Three credits. Prerequisite: EKIN 258.

Human anatomy and its application to physical activity, exercise and sport. Van Heest

266-267. Instruction and Curriculum in the Secondary School
(Formerly offered as ESLE 266 and ESLE 267.) Either or both semesters. Three or six credits.

Teaching procedures for physical education in secondary schools.

272. Sport Biomechanics
(Formerly offered as ESLE 272.) First semester. Three credits. Prerequisite: Biology: PNB 264-265. Garrett

Qualitative analysis of linear and angular motion, force and torque, momentum, energy, equilibrium, projectiles, aerodynamics.

273. Special Physical Education: Adapted, Corrective, Developmental
(Formerly offered as ESLE 273.) First semester. Four credits. Three class periods and laboratory/clinical periods by arrangement. Prerequisite: Biology: PNB 265. Castagnino

Physical activity for persons with disabilities.

277. Directed Student Teaching
(Formerly offered as ESLE 277.) Either semester. Credits and hours by arrangement. Prerequisite: EKIN 266. Open only to students in the School of Education. Application, signed by the advisor, must be made to the Coordinator of Student Teaching for the fall semester prior to March 1; for the spring semester prior to October 1.

280. Recreational Services for the Mentally Ill
(Formerly offered as ESLE 280.) First semester. Three credits. Shivers

Planning, implementation, programming, evaluation, and treatment team functions for clients, using systematic practice.

281. Introduction to Sport Marketing
(Formerly offered as ESLE 281.) Second semester. Three credits. Prerequisites: ECON 111, 112. Open to EKIN majors or with consent of instructor.

This course introduces the basic concepts, principles, and tools for sport marketing.

282. The Sociology of Leisure
(Formerly offered as ESLE 282.) Second semester. Three credits. Prerequisite: SOCI 107 or 107W or SOCI 115 or 115W. Yiannakis

An examination of the functions of leisure (& tourism) for society and the individual, with special emphasis on life satisfaction, self actualization over the life course, gender issues, and societal constraints with regard to leisure satisfaction.

283. The Organization of Recreational Services
(Formerly offered as ESLE 283.) Second semester. Three credits. Prerequisite: EKIN 204. Servedio

Programming activities in public and private agencies emphasizing personnel needs, facilities, marketing, and organization.

284. Introduction to Recreational Service Administration
(Formerly offered as ESLE 284.) First semester. Three credits. Prerequisite: EKIN 204. Servedio

Management practices, legal issues, budgeting, and supervision.

285. Therapeutic Recreational Service for the Physically Disabled and the Neurologically Impaired
(Formerly offered as ESLE 285.) Second semester. Three credits. Prerequisite: EKIN 203, EKIN 205. Shivers

Adaptive programming for clients with permanent disabilities.

286. Issues in Sport
(Formerly offered as ESLE 286.) Either semester. Three credits. Open to EKIN majors only. Morrow

Contemporary issues in sport and physical education: leadership, communication, time management, future trends.

289. Leadership in Recreational Services
(Formerly offered as ESLE 289.) Second semester. Three credits. Shivers

Group dynamics and interpersonal behavior theories with leadership techniques for field application.

289W. Leadership in Recreational Services

290. Internship
(Formerly offered as ESLE 290.) Either semester or summer. Variable. Prerequisite: In accordance with departmental policy, students will have completed all academic course work in their concentration excluding Sport Medicine/Athletic Training prior to undertaking the internship. May be repeated for credit. Open to EKIN majors only.

Field service or experiences in cooperating agencies.

292. Emergency Procedures in Athletic Training
(Formerly offered as ESLE 292.) First semester. Three credits. Prerequisite: PNB 264 and PNB 265. Open only to Athletic Training Concentration first year students. Consent of program director required. 
Casa

Evaluation and treatment skills for athletic injuries to the head, face, neck, trunk, spine, thorax, and abdomen. Acute first-aid considerations in life-threatening situations will also be covered in-depth.

295. Introduction to Honors Research
Both semesters. Three credits. Open only to EKIN Honors Students.

The student will meet with EKIN faculty members and attend laboratory/program staff meetings to survey the opportunities available for future Honors Thesis research.

296. Honors Literature Review
Both semesters. Three credits. Prerequisite: EKIN 295 or consent of instructor. Open only to EKIN Honors Students.
The student will identify specific Honors Thesis research questions and will write a library research paper that will serve as the thesis Literature Review.

297. Honors Thesis
Both semesters. Three credits. Prerequisite: EKIN 295 and EKIN 296 or consent of instructor. Open only to EKIN Honors Students.

The student will collect and interpret data and will write the Honors Thesis, completing work begun during EKIN 296.

298. Variable Topics
(Formerly offered as ESLE 298.) Either semester. Credits and hours by arrangement. Open only with consent of instructor. May be repeated for credit with a change in content.

299. Independent Study for Undergraduates
(Formerly offered as ESLE 299.) Either semester. Credits and hours by arrangement. Open only to seniors with consent of the Department Head. May be repeated for credit with a change in content.

Laboratory or library research to expand understanding of a specialized topic in sport, leisure, or exercise sciences.

Electrical and Systems Engineering (EE)

Note: The name of this department will change to Electrical and Computer Engineering in the spring semester of 2001.

Head of Department: Professor A.F.M. Anwar
Department Office: Room 312, A.B. Bronwell Building (Engineering III)
For major requirements, see the School of Engineering section of this Catalog.

201. Fundamentals of Circuit Analysis
Either semester. Three credits. Three class periods and one discussion period. Prerequisite: MATH 211 and PHYS 152, both of which may be taken concurrently. Open to sophomores. This course and EE 220 may not both be taken for credit. Enderle, Jordan


202. Signals and Systems
Either semester. Three credits. Three class periods and one discussion period. Prerequisite: EE 201 or EE 220. Bar-Shalom, Luh, Pattipati

Representation of signals in the time and frequency domains. Fourier series. Fourier and Laplace transform methods for analysis of linear systems. Introduction to state space models. Introduction to sampling and discrete systems analysis via z transforms.

204. Electronic Devices and Circuits
Either semester. Three credits. Prerequisite: EE 201. This course and EE 239 may not both be taken for credit. Anwar, Donkor

Physical electronics underlying the operation of modern solid-state devices. Diodes and diode circuits. The bipolar junction transistor and field-effect transistors. Models of transistors. Applications of transistors to integrated circuits such as operational amplifiers and logic gates.

205. Electromagnetic Fields and Waves
Either semester. Three credits. Prerequisite: PHYS 152 and MATH 210 and 211. Not open for credit to students who have received credit for EE 206. Bansal

Application of electric and magnetic field theory to engineering problems involving conductors, dielectrics, semiconductors, magnetic materials, the motion of charged particles, and wave propagation. Relationship between fields and circuit parameters in the context of transmission lines and radiation.

206. Electromagnetic Fields and Applications
First semester. Three credits. Prerequisite: EE 201. This course and EE 205 cannot both be taken for credit.

Bansal

Electrostatics and the behavior of charged particles in an electric field; capacitance and energy storage. Magnetostatics, magnetic materials and circuits; Ampere’s law and the Biot-Savart law. Maxwell’s equations. Behavior of transformers and their applications in circuits. Principles of electromagnetic devices.

207. Electromagnetic Waves and Applications
Second semester. Three credits. Prerequisites: EE 205 or EE 206. Bansal


209W. Electrical Circuit Design Laboratory
Either semester. Two credits. One 2-hour laboratory period and one 1-hour discussion period. Prerequisite: EE 201, which may be taken concurrently. Open to sophomores. Donkor


215. Digital Integrated Circuits
Semester by arrangement. Three credits. Prerequisite: EE 201, which may be taken concurrently. Open to sophomores. Donkor

Switching, timing, wave shaping, and logic circuits to generate waveforms and functions used in pulse systems, instrumentation and computers. Emphasis is on integrated circuits.

220. Electrical Engineering Principles
First semester. Three credits. Prerequisite: MATH 210 and 211, which may be taken concurrently, and PHYS 152. This course and EE 201 may not both be taken for credit.

Basic concepts of circuit analysis as applied to electronic circuits and electromechanical devices, including measuring instruments.

224. Electromechanical Energy Conversion
Semester by arrangement. Three credits. Prerequisite: EE 202 and EE 206 or consent of instructor.

Equivalent circuits and characteristics of multiphase transformers. Per-unit system. Analysis of balanced conditions on multiphase power systems. Principles of a-c and d-c machinery and other electromechanical devices, emphasizing dynamic characteristics. Applications to power and control systems.

226. Physical Electronics
Second semester. Three credits. Prerequisite: EE 204, which may be taken concurrently. Anwar

Fundamental physical processes underlying the operation of modern electronic devices. P-n junctions, bipolar and field-effect transistors, and solar cells. Electrical conduction in solidstate and gaseous electronic devices.

228. Fiber Optics
First semester. Three credits. Prerequisite: EE 205 or EE 207 or PHYS 255. Bansal, Cheo

Application of Maxwell’s equations and geometric optics first to two-dimensional dielectric waveguides and then to cylindrical fibers. Ray and mode theory, eigenvalues, Goos-Haenchens shift. Step-index, graded-index, and single-mode fibers. Splicers, couplers, sources, detectors and optical design. Fiber manufacturing techniques.

229. Fiber Optics Laboratory
Second semester. Three credits. One four-hour laboratory period. Prerequisite: EE 228. Bansal, Cheo

Hands-on design and measurement of fiber-optic applications. Fiber-optic communications and fiber-optic sensors. Structured experiments and design projects centered around available equipment.

230. Electrical Instrumentation
First semester. Three credits. Prerequisite: EE 202, EE 204 and CSE 207. Fox


232. Systems Analysis
Either semester. Three credits. Prerequisite: EE 202. Pattipati, Soulbby


233. Basic Feedback Control Theory
First semester. Three credits. Prerequisite: EE 232. Pattipati


234. Digital Control Systems
Second semester. Three credits. Prerequisite: EE 232. Jordan, Pattipati


239. Electronic and Electromechanical Components and Circuits
Second semester. Three credits. Prerequisite: EE 201 or 220. This course and EE 204 may not both be taken for credit.

Analysis of basic electronic and electromechanical components and circuits with design applications in instrumentation, communications and control.

240. Electronic Circuits and Applications
Second semester. Three credits. Prerequisite: EE 204 and 232. Fox

Analysis and design of linear amplifiers. The effects of feedback in tuned, video, and operational amplifiers. Noise, stability, and frequency compensation. Applications encompass active filters, oscillators, phase lock loops and nonlinear operations such as
multiplication, modulation, sampling, and analog-to-digital conversion.

241. Communication Systems
First semester. Three credits. Prerequisite: EE 202, and STAT 224Q or consent of instructor. Tong, Willett

242. Digital Communications and Networks
Second semester. Three credits. Prerequisite: EE 202 and STAT 224Q or consent of instructor. Willett

245. Micro/Opto-electronic Devices
Second semester. Three credits. Prerequisite: EE 204 or consent of instructor. Anwar, Jain
Principles and applications of contemporary solid state devices such as light-emitting diodes, injection lasers, solar cells, p-n-p-n diodes, SCR and Triacs, IMPATT diodes, Schottky devices, bipolar and MOS transistors, MESFETs and MODFETs, and fundamentals of integrated circuits.

246. Introduction to Dielectric and Magnetic Materials
Semester by arrangement. Three credits. Prerequisite: EE 205 or EE 206

247. Introduction to Digital Signal Processing
Second semester. Three credits. Prerequisite: EE 207 or EE 206.
Discrete-time signals and systems. The z-transform. Digital filters; stability, frequency response, causonic realizations and state equations. Fourier methods for discrete signal representation; Fourier transform of sequences, the discrete Fourier transform, and the FFT. Design of linear digital filters in time and frequency domains. Spectrum analysis and filtering via the FFT.

249. Very Large Scale Integrated Circuit (VLSI) Design and Simulation
First semester. Three credits. Two-hour lecture and three-hour laboratory period. Prerequisite: EE 215 or consent of instructor, and EE 245. Not open for credit to students who have passed EE 248 or EE 269. Jain
Design of MOS transistors, including short channel effects in sub-micron devices; scaling laws; fabrication technologies. Layout of NMOS and CMOS logic gates; power-delay calculations. Design of static and/or dynamic memories. Laboratory emphasizes schematic capture, simulation, timing analysis; layout of custom IC's; use of VHDL; scaling laws and design of 0.25 micro circuits.

252. Digital Systems Design
(Also offered as CSE 252.) Either semester. Three credits. Prerequisite: CSE 243 or both CSE 240 and CSE 241. Not open for credit to students who have passed CSE 252.
Design and evaluation of control and data structures for digital systems. Hardware design languages are used to describe and design alternative register transfer level architectures and control units with a microprogramming emphasis. Consideration of computer architecture, memories, digital interfacing, timing and synchronization, and microprocessor systems.

257. Numerical Methods in Scientific Computation
(Also offered as CSE 257.) Either semester. Three credits. Prerequisite: Either CSE 110C or CSE 130C or ENGR 150C and MATH 210Q and 211Q or consent of instructor. Soulsby
An Introduction to the numerical algorithms fundamental to scientific computation. Equation solving, function approximation, integration, difference and differential equations, special computer techniques. Emphasis is placed on efficient use of computers to optimize speed and accuracy in numerical computation. Extensive digital computer usage for algorithm verification.

261. Electrical Engineering Laboratory A
Either semester. Three credits. One class period and one four-hour laboratory period. Prerequisite: CSE 208W, EE 209W, EE 202 and EE 204, which may be taken concurrently or consent of instructor. M. Ayers
Introductory design laboratory. Use of personal computers to design and measure performance of analog electronic circuits and systems. Design with both integrated circuits and discrete components. Design of active filters, effects of feedback to broadbanding, oscillator design, A/D and D/A conversion systems, and low-noise amplifier design.

262. Electrical Engineering Laboratory B
Either semester. Three credits. One class period and one four-hour laboratory period. Prerequisite: EE 202 and EE 204, which may be taken concurrently or consent of instructor. M. Ayers
Intermediate design laboratory. Solution of practical design problems in electronic circuits, control systems, digital systems, physical electronics, biomedical electronics and power systems.

263. Electrical Engineering Laboratory C
Either semester. Three credits. One four-hour laboratory. Prerequisite: EE 207 and EE 262, which may be taken concurrently. Donkor
Design and experimental evaluation of circuits and systems useful in control, communication, and other applications. Rotating machines, servomechanisms, transducers, transmission lines, antennas, oscillators, modulation and detection, wave shaping and switching circuits.

265. Independent Design Laboratory
Either or both semesters. Three credits. Prerequisite: EE 262 and consent of instructor. May be taken twice for credit.
Experimental design project undertaken by the student by special arrangement with a faculty member of the Department of Electrical & Systems Engineering.

266. Microprocessor Applications Laboratory
First semester. Three credits. One class period and one four-hour laboratory. Prerequisite: EE 262, and EE 232 which may be taken concurrently. Fox
Design of software and interface hardware to use a microcomputer as an on-line, real-time element in data acquisition, filtering and control systems. Use of digital clocks, D/A's, A/D's, speech synthesis modules, and movement generators. Design project. Written and oral presentations of laboratory results.

267. Systems Laboratory
Second semester. Three credits. One four-hour laboratory period. Prerequisite: EE 232 and EE 282. Jordan, Willett
Real-time digital control and signal processing systems. Typical topics include liquid level control, velocity and position control, digital filters, image processing, and power control electronics. Written and oral presentations of laboratory results.

268. Micro/Opto-electronic Devices and Circuits Fabrication Laboratory
Second semester. Three credits. One class period, and one 4-hour laboratory period. Prerequisite: EE 245, EE 215 or consent of instructor. Anwar, Jain
Semiconductor wafer preparation and characterization including: determination of carrier concentration, mobility, and lifetime; oxidation, diffusion, metallization, mask layouts, and photolithographic techniques as employed in the realization of device and circuits; design of basic IC components such as transistors, resistors, and capacitors; monolithic fabrication of simple digital/ analog circuits. Design project. Written and oral presentations of laboratory results.

271. Physiological Control Systems
Semester by arrangement. Three credits. Prerequisite: EE 232.
Analysis of human physiological control systems and regulators through the use of mathematical models. Identification and linearization of system components. System interactions, stability, noise, and the real-time processing of system deviations (e.g., bipolar and MOS transistors, solar cells) and integrated circuits; design of basic IC components such as transistors, resistors, and capacitors; monolithic fabrication of simple digital/ analog circuits. Design project. Written and oral presentations of laboratory results.

272. Introduction to Biomedical Engineering
First semester. Three credits. Prerequisite: BIOL 107, Co-prerequisite: PHYS 151Q and MATH 210Q. Open to sophomores. Fox

280. Digital Design Laboratory
(Also offered as CSE 280.) Either semester. Three credits. Prerequisite: CSE/EE 252 which may be taken concurrently.
Digital design laboratory. Use of VERILOG hardware description language and SIMULINK software for design and implementation of digital systems. Computer-aided design tools. Laboratory course. Partially cross-listed with CSE 280.

281. Digital Hardware Laboratory
(Also offered as CSE 281.) Second semester. Three credits. Four hour laboratory period. Prerequisite: CSE 208W, CSE 240 and CSE 241, or CSE 243, and CSE/EE 280. Recommended preparation: CSE/EE 252, Barker
Advanced combinational and sequential circuit design and implementation using random logic and microprocessor based system. Hardware and software interface to the basic system. Serial communication, user program loading and execution. Microcontrollers - familiarization and inclusion in design.

290. Computer and Electrical Engineering Design I
(Also offered as CSE 290.) Either semester. Two credits. Prerequisite: This course is taken by seniors in the semester before EE 291. (Formerly offered as EE
Introduction to Engineering II

(Also offered as EE 270.) Either semester. Three credits. Prerequisite: EE 290. Hours to be arranged. (Formerly offered as EE 270.) Enderle, Jordan

Design of a device, circuit, system, process, or algorithm. Team solution to an engineering design problem as formulated in CSE/EE 290, from first concepts through evaluation and documentation. Written progress reports, a final report, and oral presentation are required.

Special Topics in Electrical Engineering

Semester by arrangement. Credits by arrangement. Prerequisite: Announced separately for each course. With a change in content, this course may be repeated for credit.

Individual exploration of special topics as arranged by the student with course instructor.

Engineering (ENGR)

Dean: Amir Faghri
Assistant Dean for Undergraduate Education: M.E. Wood
Director of Undergraduate Advising: David Jordan
Office: Room 326, EII Castleman Building

Orientation to Engineering

First semester. One credit. Fifteen class periods of lecture, and eight seminar and discussion periods. Not open for credit to upper division students in the School of Engineering. Not open for credit for students who have passed ENGR 100 or 166.

A series of orientation lectures on the many fields of engineering, followed by a series of seminars and discussions in engineering discipline-specific sections on engineering topics.

Introduction to Engineering I

Either semester. Three credits. Two lecture periods and one 2-hour discussion period. Not open for credit to upper division students in the School of Engineering. Not open for credit for students who have passed ENGR 100 or 166.

Introduction to engineering and the engineering profession. Topics include: problem solving, design projects, group work, oral and written reports, Fortran computer programming, and engineering graphics.

Introduction to Engineering II

Either semester. Three credits. Two lecture periods and one 2-hour discussion period. Prerequisite: ENGR 150C or CSE 110C, and MATH 110Q or 113Q or 115Q, which may be taken concurrently. Not open for credit to upper division students in the School of Engineering. Not open for credit for students who have passed ENGR 100 or 166.

Introduction to engineering and the engineering profession through application of physical conservation principles in analysis and design. Topics include: problem solving, conservation laws, materials properties and selection, engineering economics, group design projects, and oral and written reports.

Foundations of Engineering

Second semester. Three credits. Two class periods of lecture, and one two period laboratory per week. Not open for credit to upper division students in the School of Engineering. Not open for credit for students who have passed ENGR 150 or 151.

Introductory topics in a specific engineering major. Topics selected by Department or Program, or Regional Campus faculty. Students to select section based on their selected or intended major. In the context of the discipline, students would develop skills transferable to other engineering disciplines.

History of Materials and Technology

First semester. Three credits. Open to sophomores. May not be used as a professional requirement in the School of Engineering. Kattamis

Evolution of man’s knowledge of materials and technology from prehistoric cultures until the Industrial Revolution. Interaction between materials, art, science and technology. Goals, status and methods of the materials technologist in Sumerian, Babylonian, Egyptian, Greek, Roman, Extreme Oriental, Islamic civilizations and through the Middle Ages and the Renaissance in modern civilizations set in the political, social, and economic frames of the times.

History of Engineering

Second semester. Three credits. Open to sophomores. May not be used as a professional requirement in the School of Engineering. Kattamis

History of civil, electrical, mining, metallurgical, chemical, mechanical, naval, aeronautical and textile engineering from the Industrial Revolution to the dawn of the twentieth century. Interaction between technology, and industrial, economic, political and cultural forces.

EUROTECH Internship Abroad

Semester by arrangement. No credit. Prerequisite: consent of instructor.

A six-month internship in Germany, Austria, or Switzerland for the EUROTECH Program. The student must arrange with the instructor for this internship at least one year before the intended departure date and participate in the orientation program. To successfully complete this course the student must submit periodic reports in German on the assigned work during the work period and a final report upon return.

Special Topics in Engineering

Either semester. Three credits. Open to sophomores. May not be used as a professional requirement in the School of Engineering. Kattamis

Ph.D. research in special topics as announced in advance for each semester.

Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

# English 112W, 113W, 127W, and 230W are offered at regional campuses only.
from the Middle East, South Asia, China, Japan, and Southeast Asia. All works are read in translation.

127. Major Works of English and American Literature
Either semester. Three credits. Required preparation: ENGL 105. Not open for credit to students who have passed ENGL 128 at the regional campuses.
Includes important works from the major genres and historical periods since Beowulf.

#127W. Major Works of English and American Literature
(Formerly offered as English 128 at the regional campuses.) Required preparation: ENGL 105 and 109; the latter may be taken concurrently.

146. Creative Writing I
First course in creative expression in fiction, poetry, and other forms.

193. Foreign Study
Either or both semesters. Credits and hours by arrangement. May be repeated for credit. Consent of Department Head or advisor may be required prior to the student's departure.
Special topics taken in a foreign study program.

200. Children's Literature
Either semester. Three credits.
The best literature available to children, including works by major writers and forms such as fable, folk tale, fairy tale, nursery rhyme, and short story.

201. Literature for High School Students
Either semester. Three credits. Designed primarily for English education majors. May not be used to meet the English major requirement.
An introduction to the guidance of high school reading in literature.

204. Milton
Either semester. Three credits.
The lyric, epic and dramatic poetry of Milton, with some consideration of his prose writing.

205. British Literature I
British literature, medieval through 18th century. Intended to provide preparation for more advanced courses in British literature. This course is strongly recommended for English majors.

206. British Literature II
British literature, 19th to 20th centuries. Intended to provide preparation for more advanced courses in British literature. This course is strongly recommended for English majors.

209W. Advanced Composition for Prospective Teachers
Either semester. Three credits. Open to sophomores. Designed primarily for English education majors. May not be used to meet the English major requirement.
Advanced training in composition, with consideration of the problem of teaching writing.

210. Poetry
Either semester. Three credits. Open to sophomores.
A study of the techniques and conventions of the chief forms and traditions of poetry in English.

211. Modern Poetry in English
Either semester. Three credits.
Poetry of the 20th century, from the major modernist innovators to significant contemporaries.

212. The Modern Novel
Either semester. Three credits. Open to sophomores.
Major twentieth-century novels.

216. The Short Story
Either semester. Three credits. Open to sophomores.
The short story as a literary form with study of significant Continental, British, and American writers.

217. Studies in Literature and Culture
Either semester. Three credits. May be repeated for credit with a change in topic. Open to sophomores.
An examination of social and cultural aspects of printed literature and of its relationship to other media. Contents will vary by section.

218. Literature and Culture of the Third World
Either semester. Three credits. May be repeated for credit with a change in topic. Open to sophomores.
The literature of regions outside North America and Europe. Contents of the course will vary according to regional focus.

219. Drama
Either semester. Three credits. Open to sophomores.
An introduction to the chief forms and traditions of dramatic literature through the study of a broad range of major works.

220. Medieval English Literature
Either semester. Three credits. Open to sophomores.
Readings in the literature of the English Middle Ages — lyrics, narratives, dramas, and didactic forms.

220W. Medieval English Literature
Either semester. Three credits. Open to sophomores.
Readings in Old English, Middle English, and Early Modern literature from the British Isles, including such writers as Yeats, Eliot, Joyce, Woolf, Lawrence, Lessing, and Shaw.

221W. Renaissance English Literature
Either semester. Three credits. Open to sophomores.
Writers studied include More, Spenser, Shakespeare, Donne, Jonson, and Milton.

222. Restoration and 18th-Century English Literature
Either semester. Three credits. Open to sophomores.
Includes such writers as Dryden, Pope, Swift, Johnson, Burney, and Austen.

223. Romantic and Victorian English Literature
Either semester. Three credits. Open to sophomores.
Includes such writers as Austen, Wordsworth, Coleridge, Keats, Tennyson, Browning, the Brontes, G. Eliot, and Arnold.

222W. Restoration and 18th-Century English Literature
Either semester. Three credits. Open to sophomores.

223W. Romantic and Victorian English Literature
Either semester. Three credits. Open to sophomores.

224. The History of the English Language
Either semester. Three credits.
Readings in Old English, Middle English, and Early Modern with a survey of the main developments in the language since Anglo-Saxon times.

225. The English Language
First semester. Three credits.
A descriptive study of modern American English: constituent sound (phonology), structure of words (morphology), and syntax, with some attention to lexicography and usage.

233. Early and Modern Irish Literature
Either semester. Three credits.
Irish literature in English to 1939: fiction, drama, and verse, including such early Irish myths as the Tain bo Cuailnge and such writers as Mangan, Somerville & Ross, Yeats, Gregory, Synge, Joyce, and O'Connor.

234. Contemporary Irish Literature
Either semester. Three credits.
Modern British, American, and Continental drama, with the reading and discussion of some 25 representative plays.

242. The English Language
First semester. Three credits.
A descriptive study of modern American English: constituent sound (phonology), structure of words (morphology), and syntax, with some attention to lexicography and usage.

244. The History of the English Language
Either semester. Three credits.
Readings in Old English, Middle English, and Early Modern with a survey of the main developments in the language since Anglo-Saxon times.

246. Creative Writing II
Either semester. Three credits. Open only with consent of instructor. May be repeated for credit with a change in topic.
For student writers of proved ability who wish training in techniques of fiction or verse. Emphasis on poetry.

247. Writing Workshop
Either semester. Three credits. Open only with consent of instructor or Department Head. May be repeated for credit with a change in topic.
For student writers of proved ability who wish training in techniques of fiction or verse. Emphasis on prose fiction.

248W. Writing Tutorial
Either semester. Three credits. Hours by arrangement.
This course may be taken only in conjunction with specially designated sections of English courses numbered 200 or above and may be repeated once for credit in
concentration with a different course.

Intensive supervised practice in writing about literature.

249S. Advanced Expository Writing
Either semester. Three credits. Three class periods.
Writing on topics related, usually, to students' individual interests and needs.

249W. Advanced Expository Writing
Honors Course Sequence

The Honors course sequence, English 250 through English 258, is recommended for students in the Honors Program but is also open to other qualified students. Most courses are weekly seminars on major writers and topics relating to intellectual and cultural backgrounds of English and American literature.

250. Honors I: Approaches to Literature
First semester. Three credits. Hours by arrangement.
Open only with consent of instructor. May be used to satisfy the ENGL 105 and 109 requirements. Not open for credit to students who have passed ENGL 109. May not be used to meet the English major requirements.
Study of a variety of approaches to literature and of their critical assumptions.

251W. Honors II: American Literature
Second semester. Three credits. Hours by arrangement.
Open only with consent of instructor.
Early writers and Romantics through Twain and James.

252W. Honors III: American Literature
First semester. Three credits. Hours by arrangement.
Open only with consent of instructor.
Realism, naturalism, modern American authors.

253W. Honors IV: English Literature
First semester, alternate years. Three credits. Open only with consent of instructor.
Medieval through Jacobean literature.

254W. Honors V: English Literature
First semester, alternate years. Three credits. Hours by arrangement.
Open only with consent of instructor.

255W. Honors VI: English Literature
Second semester, alternate years. Three credits. Hours by arrangement.
Open only with consent of instructor.
Nineteenth and twentieth century literature.

256W. Honors VII: English Literature
Second semester, alternate years. Three credits. Hours by arrangement.
Open only with consent of instructor.
Twentieth century literature.

258. Honors VIII: Honors Thesis
Either semester. Credits and hours by arrangement.
Open only with consent of instructor. All Honors students writing an Honors Thesis must register for this course in their last semester after consultation with the director of their thesis and the English department advisor to Honors Students, who is the instructor of record.

264. Studies in Individual Writers
Either semester. Three credits.
Concentrated study in one or two authors writing in English. May be repeated for credit with change in topic.

266. Studies in Criticism
Either semester. Three credits.
Studies in the history and theories of literary criticism.

267. Studies in Literature
Either semester. Three credits. May be repeated for credit with change in topic.
Advanced exploration of various limited topics, such as a particular literary theme, form, or movement, to be announced from semester to semester.

268W. Seminars in Literature
Either semester. Three credits. May be repeated for credit with a change in topic.
Intensive study of various limited topics, such as a particular literary theme, form, or movement, to be announced from semester to semester. Small classes with an emphasis on writing.

270. American Literature to 1880
Either semester. Three credits. Open to sophomores.
American literature from the beginnings: Poe, Emerson, Thoreau, Hawthorne, Melville, Whitman, Douglass, Stowe, Dickinson, Twain, and others.

270W. American Literature to 1880
First semester. Three credits. Open to sophomores.

271. American Literature Since 1880
Either semester. Three credits. Open to sophomores.
Modern and contemporary American literature: James, Wharton, Dreiser, Cather, Frost, Hemingway, Fitzgerald, Faulkner, Morrison, and others.

271W. American Literature Since 1880
Second semester. Three credits.

272. Native American Literature
Either semester. Three credits. Open to sophomores.

273. Asian American Literature
Also offered as ASAI 273. Either semester. Three credits. Open to sophomores.

274. Asian American Literature
First semester. Three credits.

276W. Black American Writers I
First semester. Three credits.

277. Black American Writers II
Second semester. Three credits.

278. Ethnic Literatures of the United States
Either semester. Three credits.
The literatures of ethnic American authors. Writers may include Natachee Scott Momaday, Maxine Hong Kingston, Zora Neale Hurston, Rolando Hinojosa, Bernard Malamud, Nicholasa Mohr, John Fante, among others.

280. Women in Literature Before 1900
First semester. Three credits.

281. Women in Twentieth-Century Literature
First semester. Three credits.

282. Literature and Other Disciplines
Either semester. Three credits. May be repeated for credit with a change in topic.
The relationship of literature to other fields of study. Course content will vary by section.

292. Studies in Britain
Second semester. Three credits. Hours by arrangement.
Open only with consent of instructor.

293. Foreign Study
Either or both semesters. Credits and hours by arrangement.
May be repeated for credit. Consent of department head required, normally to be granted prior to the student’s departure. May count toward the major with consent of the advisor.

Special topics taken in a foreign study program.

294C. Publishing

An introduction to publishing and to writing for publication in this, the Information Age. Topics include desktop publishing, web-page design, and the presentation of materials on the Internet. No previous experience with computers is required.

295. Variable Topics
Either semester. Three credits. With a change in topic, may be repeated for credit. Prerequisites, required preparation, and recommended preparation vary.

296. Writing Practicum
Either semester. Credits and hours by arrangement. May be repeated for credit with a change in topic.
A concentrated introduction to (or review of) a particular aspect of composition. Courses will focus on such topics as writing and publishing on the Internet, legal writing, grammar review, grammar by computer, business writing, and web-page design.

297. Writing Internship
Either semester. Credit and hours by arrangement, not to exceed six credits per semester. With a change of placement, may be repeated once for credit. Open only with consent of instructor. No more than three credits may be counted towards completion of requirements for the English major.
Training in writing in a supervised field placement.

298. Special Topics
Either semester. Credits and hours by arrangement. With a change in content, may be repeated for credit. Prerequisites, required preparation, and recommended preparation vary.

299. Independent Study
Either semester. Credits and hours by arrangement. Open only with consent of instructor and approval of either the department head, or the department undergraduate coordinator. May be repeated for credit with a change of topic.

Supervised reading and writing on a subject of special interest to the student. (Recommended for distinction candidates in English.)

† Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).
110. The Environmental Debate I
Second semester. One credit. May be repeated for credit (maximum of 3 credits). Open only with consent of instructor.

Structured review of environmental issues and active debate during class time. Presentation of current environmental issues by environmental professionals and experts.

112. The Environmental Debate II
Second semester. One credit. May be repeated for credit (maximum of 3 credits).

Structured review of environmental issues and active debate during class time. Presentation of current environmental issues by environmental professionals and experts.

251. Civil Engineering Systems
(Also offered as CE 251.) First semester. Three credits. Prerequisites: CE 297 or CHEG 223 and CHEG 265. Hydraulic Engineering

dynamics and kinetics. Design projects.

260. Water Quality Engineering
(Also offered as CE 260.) Second semester. Three credits. Prerequisites: CE 263 and 297. Abboud, Smets

Physical, chemical, and biological principles for the treatment of aqueous phase contaminants; reactor dynamics and kinetics. Design projects.

262. Environmental Engineering Laboratory
(Also offered as CE 262.) Second semester. Three credits. Two class periods and one 3-hour laboratory period. Prerequisites: CE 263 and 297 or CHEG 223 (which may be taken concurrently). Abboud, Smets

Aqueous analytical chemical techniques, absorption, coagulation/flocculation, fluidization, gas stripping, biokinetics, interpretation of analytical results, bench-scale design projects, written and oral reports.

263. Environmental Engineering Fundamentals
(Also offered as CE 263.) Both semesters. Three credits. Prerequisites: CHEM 128 or 130 and MATH 211 (which may be taken concurrently). Open to sophomores. Hoag, Nikolaidis, Smets


265. Hydraulic Engineering
(Also offered as CE 265.) Second semester. Three credits. Prerequisites: CE 297 or CHEG 223 and CHEG 224. Abboud, Smets, Ogen

Design and analysis of water and wastewater transport systems, including pipelines, pumps, pipe networks, and open channel flow. Introduction to hydraulic structures and porous media hydraulics. Computer applications.

266. Hydraulic Engineering Laboratory
(Also offered as CE 266.) Second semester. Two credits. One class period. One 2-hour laboratory. Prerequisites: CE 297.

Tests and investigation of the flow of oils, water, and other fluids through orifices, nozzles, wires, and pipes; calibration of measuring devices; experiments with turbines and pumps.

267. Engineering Hydrology
(Also offered as CE 267.) First semester. Three credits. Prerequisites: CE 297 or CHEG 223 and CHEG 224. Abboud, Smets


268. Limnology
(Also offered as CE 268 and as EEB 247.) First semester. Three credits. Prerequisites: MATH 109 or 112 or 115 and an introductory course in CHEM (CHEM 122, 127, or 129); an introductory course in Biology is recommended.

Physical, chemical, and biotic interrelationships of freshwater habitats.

270. Environmental Engineering Chemistry
First semester. Three credits. Prerequisites: CHEM 128 or 130. MATH 211 or consent of instructor. Open only with consent of instructor.

Quantitative variables governing chemical behavior in environmental systems. Thermodynamics and kinetics of acid/base, coordination, precipitation/dissolution, and redox reactions. Organic chemistry nomenclature.

279. Environmental Modeling
(Also offered as CE 279.) Second semester. Three credits. Prerequisite: CE 263 and CHEG 223 or CE 297 or consent of instructor. Nikolaidis

Systematic approach for analyzing contamination problems. Systems theory and modeling will be used to assess the predominant processes that control the fate and mobility of pollutants in the environment. Assessments of lake eutrophication, conventional pollutants in rivers and estuaries and toxic chemicals in groundwater.

280. Introduction to Environmental Rate Processes
(Also offered as CHEG 280.) First semester. Three credits. Recommended preparation: CHEM 128.

Application of thermodynamics, chemical kinetics and transfer operations to environmental problems; water pollution control. Open only to students not majoring in chemical engineering.

281. Introduction to Water Pollution
(Also offered as CHEG 281.) Second semester. Three credits. Recommended preparation: CHEG 224.

Water purification and water quality control; aeration and mass transfer, biological mechanisms and kinetics; design of biological reactors and sludge treatment facilities; design and operation of physical purification methods; alternative processes for industrial wastewater treatment.

283. Introduction to Biochemical Engineering
(Also offered as CHEG 283.) Second semester. Three credits. Recommended preparation: CHEG 224 and 251.

Enzyme and fermentation technology; microbiology, biochemistry, and cellular concepts; biomass production; equipment design, operation, and specification; design of biological reactors; separation processes for bio-products.

285. Introduction to Air Pollution
(Also offered as CHEG 285.) Second semester. Three credits. Recommended preparation: CHEG 211 or ME 233 or ME 238.

Gaseous pollutants and their properties; basic analytical techniques for air pollutants; particulate pollutants and their properties; equipment design for removal of gaseous and particulate materials; economic and environmental impact of air pollutants; federal and state regulations.

290. Environmental Engineering Design I
First semester. Three credits. To be taken during the senior year.

Basic aspects of environmental engineering design from data acquisition through preliminary design, cost estimating and final specifications. Report writing will be an integral part of the course.

291. Environmental Engineering Design II
Second semester. Three credits. Prerequisite: ENVE 290. To be taken during the senior year.

Implementations of protocols and techniques covered in Course 1 to a specific environmental scenario. Instructors will supply initial conditions and performance expectations. Reporting writing will be an integral part of the course.

295. Special Topics in Environmental Engineering
Semester, credits, and hours by arrangement as announced. Prerequisite and consent: Announced separately for each course. Course may be repeated for credit. Classroom or laboratory course on specific topics as announced.

296. Thesis
Either semester. Three credits. Prerequisite: Consent of instructor.

Designed to extend student knowledge in a specialized area of environmental engineering and introduction to research.

European Studies (ES)

Program Advisor for Center for European Studies: Ludmilla Burns

Office: Room 306, Wood Hall

293. Foreign Study
Either or both semesters. Credits and hours by arrangement. May be repeated for credit. Consent of Director required, normally to be granted prior to the student’s departure. With a change in content, may be repeated for credit.

295. Special Topics in European Studies
Either or both semesters. Three credits. With a change in topic, may be repeated for credit.

Intensive study of specialized topics related to Europe, not ordinarily covered in the undergraduate curriculum; normally one-time offerings taught by distinguished visiting scholars and/or jointly appointed faculty.

298. Variable Topics
Either or both semesters. Credits to a maximum of three.

Intensive study of specialized topics related to Europe not ordinarily covered in the curriculum. With change in topic, may be repeated for credit.

299. Independent Study
Either semester. Credits and hours by arrangement. Requires independent study Authorization Form from European Studies faculty.
Finance (FNCE)

Head of Department: Professor Thomas J. O’Brien  
Department Office: Room 402, School of Business Administration  
For major requirements, see the School of Business Administration section of this Catalog. 
Courses in the department are open to juniors and seniors only with the exception of FNCE 198.

198. Contemporary Issues in Finance  
Semester by arrangement. One credit. May be repeated for credit in different sections in combination with BADM 198 or MGMT 198 up to a maximum of three credits. Open to freshmen and sophomores, others with consent of instructor. May not be used to satisfy upper division/major requirements in the School of Business Administration.

The world of business has changed. No longer can we refer to the cliché “business as usual.” Today’s business world is a complex, challenging and exciting place. Each section of the course will capture some aspect of this challenge and excitement. Students will be exposed to undercurrents that challenge and perplex today’s managers and executives around the world.

201. Financial Management  
 Either semester. Three credits. Prerequisite: ACCT 200, (may be taken concurrently), ECON 111 and 112, ENGL 105 and 109, MATH 106 or 114 or 116, STAT 100 or 110.

An introductory examination of how a business plans its needs for funds, raises the necessary funds, and invests them to attain its goals.

202. Investment and Security Analysis  
 Either semester. Three credits. Prerequisite: FNCE 201.

A study of the nature of securities, the mechanics and costs of trading, and the way in which securities markets operate. Risk-return analysis will be applied in making decisions to buy or sell stocks, bonds and options. Written analysis is required.

202W. Investment and Security Analysis  
 First semester. Three credits.

Applications in Financial Management  
 First and/or second semester. Three credits. Prerequisite: FNCE 201. Completion of OPIM 203C is strongly recommended.

An intermediate level course using cases i.e., problems faced by actual firms, to teach students how to apply financial management concepts and techniques to real-world situations.

203P. Applications in Financial Management  
 Must be taken with FNCE 206P to equal one W requirement.

204. Financial Risk Management  
 First and/or second semester. Three credits. Prerequisite: FNCE 201.

Applications of financial structuring and engineering with particular attention to uses of derivatives.

205. Global Financial Management  
 Either semester. Three credits. Prerequisite: FNCE 201.

Focuses on the detailed study of: (1) exchange rate determination, (2) operation of the foreign currency and global capital markets, and (3) hedging both transaction and economic exposure to exchange rate changes.

206. Financial Services  
 First and/or second semester. Three credits. Prerequisite: FNCE 201.

Study of the role of financial services companies in the money and capital markets, funds acquisitions, investment and credit extension.

206P. Financial Services  
 Must be taken with FNCE 203P to equal one W requirement.

217. Economics for Global Business Decisions  
 First and/or second semester. Three credits. Prerequisite: FNCE 201 (may be taken concurrently).

Impact of globalization of the world economy on business and financial decisions. Trade, balance of payments, tariff policies, international economic institutions, exchange rates, capital flows.

221. Risk Management and Insurance  
 Either semester. Three credits.

A study of the concept of risk and its treatment by insurance. It covers why the individual or corporation purchases insurance, what constitutes an intelligent insurance plan and what products are available in the insurance marketplace.

223. Health Insurance  
 Second semester. Three credits. Prerequisite: FNCE 221 or permission of instructor.

This course will provide a detailed overview of health insurance from the perspective of insurance company owners, employers, and individual consumers of health insurance services. Emphasis is given to individual and group health insurance product management and to the relationship between product characteristics and insurance company investments, financing, and marketing decisions. Managed care techniques, benefit package design and cost sharing mechanisms are assessed in the context of resolving incentive conflicts and meeting cost-containment objectives. Evaluation of insurance company financial strength and the impact of regulation on company management and behavior are considered in detail.

224. Social Insurance  
 Second semester. Three credits.

An examination of causes, effects and proposed remedies for financial insecurity resulting from occupational injuries, unemployment, old age and premature death, and general illness. Emphasis is placed on the role of the government in dealing with these economic problems.

225. Life Insurance and Retirement Security  
 First and/or second semester. Three credits. Prerequisite: FNCE 221 or permission of instructor.

Focuses on the basic principles underlying life insurance, pensions, and other methods of insuring for financial security. Emphasis is given to the following general topics—the need for life insurance and annuities, individual retirement planning, employer provided group insurance and pensions, types of life insurance and annuity contracts, deferred compensation plans, the mathematics of life insurance, company operations, regulation, settlement options and life insurance programming.

228. Risk Management: Property and Liability Exposures  
 First semester. Three credits. Prerequisite: FNCE 221.

This course critically examines the risk management process introduced in FNCE 221. Emphasis is on identification and treatment of pure loss exposures faced by commercial and institutional entities. Available risk management treatment techniques are identified and discussed. Analysis of applicable commercial property and liability insurance coverages is stressed.

228W. Risk Management: Property and Liability Exposures  
 Either semester. Three credits.

Overview of the personal, social and business aspects of real estate. Emphasis on home purchase decisions, location analysis, market characteristics and investment decision-making.

230. Real Estate Principles  
 Either or both semesters. Three credits. Prerequisite: FNCE 201 (may be taken concurrently).

Risk-return analysis for alternate types of real estate investments. Techniques and applications of investment decision-making and value estimation. Lease analysis, cash flow, forecasting, appraisal techniques, discounted cash flow modeling, portfolio management, and equity securitization including real estate investment trusts.

232. Real Estate Investments  
 First or second semester. Three credits. Prerequisite: FNCE 201 (may be taken concurrently).

Investment characteristics of mortgages and the structure and operation of mortgage markets—both primary and secondary, including the role of securitization. Risk and return characteristics of various mortgage instruments, both residential and commercial, are analyzed from the perspective of both the borrower and lender. Tools for measuring and managing the risks of portfolios of mortgages and mortgage-backed securities are introduced.

234. GIS Applications and Use of the Internet in Real Estate Markets  
 First or second semester. Three credits.

How does a business decide where to relocate? Specialized Geographic Information Systems (GIS) are now used to make retail, office, and industrial location decisions. The Internet opens new sources of timely information. This gives decision-makers unprecedented power to manage data and analyze risks. Students gain hands-on experience with GIS and Internet through projects organized around real estate problems.

289. Field Study Internship  
 Summer session. One to three credits. Hours by arrangement. Prerequisite: Students enrolled in the Real Estate Intern program must have earned a “C” or better in Finance 230. For all others, completion of Finance 201 and at least one other finance course related to the internship area, with a grade of “C” or better in each course. Consent of instructor and Department Head prior to beginning the internship.

Designed to provide students with an opportunity for supervised field work in relevant major areas within the Department. Students will work with one or more professionals in their major academic area. Student performance will be evaluated on the basis of an appraisal by the field supervisor and a detailed written report submitted by the student.

293. Foreign Study  
 Either or both semesters. Credits and hours by arrangement, up to a maximum of six credits. Consent of Department Head required, prior to the student’s departure.

Special topics taken in a foreign study program.

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† Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).
296W. Senior Thesis in Finance
Either semester. Three credits. Hours by arrangement. Open only to Finance Department Honors Students with consent of instructor and Department Head.

296. Special Topics
Either semester. Credits and hours by arrangement. Prerequisite: Announced separately for each offering. With a change in content, may be repeated for credit.
Classroom course in special topics in finance, insurance or real estate as announced in advance for each semester.

299. Independent Study
Either or both semesters. Credits by arrangement, not to exceed six in any semester. Open only with consent of instructor.
Individual study of special topics in finance, insurance or real estate as mutually arranged between a student and an instructor.

Fine Arts (FINA)

References should be made to the offerings of art, dramatic arts and music. The courses listed below are of common interest to students in various disciplines.

Both semesters. Two credits. One 2-hour evening meeting per week. Molette
Guest lecturers and University faculty discuss their points of view as black creators, with particular reference to social context and creative expression, and discuss historical and cultural perspectives of African and African-American arts with emphasis on the influences and developments affecting African-American creators of today.

200. The Arts and Their Interrelations
Either semester. Three credits. Hours by arrangement. Open only to juniors and seniors with consent of instructor.
Comparative study of the visual arts, music and theatre in selected periods.

General Studies (GS)

Bachelor of General Studies and Non-Degree:
Room 114, Merlin Bishop Center
For major requirements, see the Extended and Continuing Education section of this Catalog.

200. BGS Continuous Registration
Either semester. No credit.
A course without academic credit for which BGS students must register when not taking credit courses at any college or university for use in the BGS program during a particular semester.

201. BGS External Study
Either semester. No credit. Open only with consent of BGS advisor.
A course without academic credit for which a BGS student must register when taking approved credit courses at another college or university for transfer back into the BGS program at the University of Connecticut.

240. Marketing Concepts and Practices into the 21st Century
Either semester. Three credits. Not applicable to SBA degree requirements.
Discussion of marketing concepts, processes, strategies and management within context of product/service organizations both in the profit and the non-profit sector whether large or small.

241. Financial Statement Analysis for Non-Financial Managers
Either semester. Three credits. Not applicable to SBA requirements.
Concepts and principles to enable non-financial managers to intelligently read and analyze financial reports.

296. BGS Internship
Either semester. Credits and hours by arrangement. Open only with consent of instructor and BGS mentor/advisor. With a change in content, may be repeated for credit.

297. BGS Summary Project
Either semester. Three credits. Open only with consent of BGS mentor/advisor.
A project demonstrating the student’s educational accomplishments and ability to synthesize the disciplines studied into a coherent whole.

298. Variable Topics
Either semester. Credits and hours by arrangement. With a change in content, may be repeated for credit.

299. Independent Study
Either semester. Credits and hours by arrangement. Open only with consent of instructor and BGS mentor/advisor. With a change in content, may be repeated for credit.

Geography (GEOG)

Head of Department: Professor Dean Hanink
Department Office: Room 437, Beach Hall
For major requirements, see the College of Liberal Arts and Sciences section of this Catalog.

104. Introduction to Geography
(Formerly offered as GEOG 150.) Either semester. Three credits. Two class periods and one 1-hour discussion/laboratory period.

Principles, concepts and methods of modern geography are developed both in general form and specific case studies. Examples pertaining to both the human and physical environment will be discussed.

105. Climate, Weather, and the Environment
Either semester. Three credits.
Interactions between weather and climate and the human and natural environment. Emphasis on understanding the linkages between natural processes and societal/environmental issues.

130. The City in the Western Tradition
(Also offered as Urban Studies 130.) Either semester. Three credits.
A broad discussion of the role and structure of the city in the western tradition from the Classical period to contemporary America. Special emphasis will be placed on the mechanisms by which cities and ideas about them have been diffused from one place to another and on the changing forces that have shaped the western city.

160. World Regional Geography
Either semester. Three credits.
Study of geographic relationships among natural and cultural environments that help to distinguish one part of the world from another. Analysis of selected countries as well as larger regions, with specific reference to the non-western world.

193. Foreign Study
Either or both semesters. Credits and hours by arrangement. May be repeated for credit. Consent of Department Head or advisor may be required prior to the student’s departure.
Special topics taken in a foreign study program.

200. Economic Geography
Either semester. Three credits. Open to sophomores.
Examination of the relationship among economic, cultural, and geographic processes which affect the patterns, structure, and growth or decline of economic activities. The global extent of the agricultural, manufacturing, and service sectors is presented with particular emphasis on the interdependency of non-western and western economies.

204. Global Issues in Human Geography
First semester. Three credits.
Geographic perspectives on global issues focusing on the relationships between human behavior/activities, and the physical, economic, and cultural environments.

205. Introduction to Physical Geography
Either semester. Three credits. Open to sophomores. Not open for credit to students who have passed GEOG 170.
The physical elements and processes of the lithosphere, hydrosphere and atmosphere are considered in relation to one another and to the distribution of the world’s environments. Emphasis on the basic concepts and theories of physical geography.

210. Social Uses of Space
(Formerly offered as Geography 211.) Second semester. Three credits.
Identification of social space (regions) at varying scales from neighborhood to national, and movement within and among these social spaces. Attention also to geographical aspects of social identity, including territoriality and community, and problems of locating social facilities.

210W. Social Uses of Space
(Formerly offered as Geography 211.)

215. Climate and Weather
First semester. Three credits.
Analysis of atmospheric processes giving rise to weather systems and climatic patterns. The dynamic integration of atmospheric systems is emphasized.

231. Location Analysis
The study of issues and approaches in location analysis. Topics include location, theory and models, impacts of locational choice, systems analysis, evaluation of service areas, land use allocation, accessibility and locational conflict. Implications for planning and public policy are stressed.

232. Principles and Applications of Physical Geography
First semester. Four credits. Required preparation: GEOG 170 or 205 or 215 or consent of instructor. Not open for credit to students who have passed GEOG 214 or 232W.
Laboratory and field study of the physical environment. Techniques, methodologies, and basic concepts of physical geography.

233. Urban Geography
(Formerly offered as GEOG 212). (Also offered as Urban Studies 233.) First semester. Three credits. Not open for credit to students who have passed GEOG 212 or URBN 212.
234. The Geography of Economic Development
Second semester. Three credits. Prerequisite: GEOG 200.
Analysis of processes and patterns of economic organization and spatial change at the international, national and intra-national scales. Examines development from both linear (neo-classical) and structuralist (political economy) perspectives, and emphasizes relationships between advanced and developing economies within the context of the global economy.

236. Human Modifications of Natural Environments
(Formerly offered as GEOG 206.) Either semester. Three credits. Not open for credit to students who have passed GEOG 206.
A geographical and historical interpretation of the changing relationships between culture and environment. Emphasis on the modification of the biophysical environment by preagricultural, agricultural and urban societies in Europe, southwest Asia, and North America.

237. Environmental Planning and Management
The basic elements of the conflict between human environments and natural systems are considered, along with the methods of analysis and resolution of problems caused by that conflict. Emphasis on public policy related to environmental issues.

238. Applied Population Geography
Either semester. Three credits. Required preparation: GEOG 104 (Formerly 150) or 200.
The study of the composition and growth of small-area populations with respect to public and private sector decision making in more developed societies. Basic concepts and techniques for analyzing local populations are presented in the context of significant population issues in the United States.

239. Geography of Asian American Experience
(Also offered as AASI 239.) First semester. Three credits.
Geographical perspective on issues facing Asian American communities: immigration, community formation, economic structure, race relations, and political participation. The changing dynamics of American ethnicity and study of the enthoburb. Diversity among Asian Americans, and comparison with other ethnic groups.

240C. Cartographic Techniques
First semester. Four credits. One 2-hour lecture and two 2-hour laboratory periods. Open to sophomores.
A laboratory-oriented Introduction to computer-based map design and compilation. Concepts of scale, symbolization, map balance, and layout are emphasized for both general and thematic mapping.

242Q. Geographic Data Analysis
Second semester. Four credits. Three class periods and one 2-hour laboratory. Recommended preparation: 100-level STAT.
An introduction to the use of quantitative methods in conducting research, with particular emphasis on the processing and analysis of geographic data.

245V. Introduction to Computer Assisted Cartography (Q.C.)
Second semester. Four credits. Three class periods and one 2-hour Laboratory. Recommended preparation: GEOG 242 or equivalent.
Introduction to numerical cartography and a review of standard computer-assisted mapping programs. Emphasis is given to data compilation for machine presentation of cartographic information. Exercises will introduce students to a variety of input and output display media.

246C. Introduction to Geographic Information Systems
The study of the fundamental principles of geographic information systems (GIS). Topics include history of the field, components of a GIS, the nature and characteristics of spatial data, methods of data capture and sources of data, database models, review of typical GIS operations and applications. Laboratory exercises provide experience with common computer-based systems.

248C. Applications of Geographic Information Systems
Second semester. Four credits. One 2-hour lecture and two 2-hour laboratory periods. Prerequisite: GEOG 246 or consent of the instructor. Not open for credit to students who have passed GEOG 247.
Applications of geographic information systems. Particular attention to land use planning and resource management.

249. Selected Topics in Geographic Information Systems
Either semester. Two credits. May be repeated once for credit with change in content. Recommended preparation: GEOG 246 or consent of the instructor. Not open for credit to students who have passed GEOG 247.
Selected problems in geospatial decisionmaking and the most commonly used GIS functions, databases, and analyses for decision support.

252. The American Landscape
Second semester, alternate years. Three credits.
The changing attitudes toward the American environment from pre-Columbian times to the twentieth century, and the consequences of those attitudes for the development of contemporary landscapes in the United States.

252W. The American Landscape
First semester, alternate years. Three credits.
Interactive study of geographic patterns in Russia, Eastern Europe and Central Asia including analyses of climate and resources; population, culture, and urbanization; economic development; and political organization in an historical and contemporary framework.

253. Geography of Russia and Eastern Europe
First semester, alternate years. Three credits.
An introduction to the Europe (including the European republics of the former U.S.S.R.). Emphasis on the economic, political, and social forces both maintaining national identities and shaping a united Europe.

254. Geography of Russia and Eastern Europe
Contemporary Europe: A Geography
Either semester. Three credits.
An introduction to the Europe (including the European republics of the former U.S.S.R.). Emphasis on the economic, political, and social forces both maintaining national identities and shaping a united Europe.

255. Geography of Latin America
Second semester. Three credits.
An integrative study of the physical, historical, social, political and economic geography of Latin America. Particular emphasis on patterns, processes and problems of spatial economic change in the region.

255W. Geography of Latin America
Second semester. Three credits.
Problems of economic, political, social and spatial integration in Latin America. Focus on past and contemporary patterns of change (including associated conflicts) examined within the context of the broader global economy.

274. Urban and Regional Planning
Either semester. Three credits. Recommended preparation: GEOG 200 or consent of instructor. Open only with consent of instructor.
Urban and regional planning, with emphasis on (1) the duties of local planners, especially land use planning, and (2) the political context for planners’ work. Legal and political issues in communities and organizations.

280W. Geographical Analysis of Urban Social Issues
Analysis of socioeconomic patterns and issues within urban areas, with emphasis on applied geographical research. Policy implications are stressed.

282V. Computer Applications in Spatial Analysis (Q.C.)
First semester, alternate years. Three credits. Recommended preparation: GEOG 242 or equivalent.
An advanced seminar in the design of computer programs for solving problems in spatial analysis. Students receive a thorough knowledge of Fortran and related graphic subroutine libraries necessary to implement individual projects.

284W. Advanced Economic Geography
Second semester. Three credits. Prerequisite: GEOG 200 or consent of instructor.
Problems involved in analyzing spatial variations of selected economic variables. Emphasis on location theory with view toward integrating geographic viewpoint and economic concepts.

285W. Advanced Physical Geography
Second semester, alternate years. Three credits. Prerequisite: GEOG 205 or consent of instructor.
Problems involving the application of physical processes in our changing environment.

286W. Environmental Evaluation and Assessment
First semester. Three credits. Recommended preparation: GEOG 205 or 236.

288W. Regional Development and Policy
First semester. Three credits. Prerequisite: GEOG 200 or consent of instructor.
A study of theory and practice in regional development and planning. Emphasis on evaluation of regional problems and public policies designed to resolve them, with a primary focus on the United States.

293. Foreign Study
Either or both semesters. Credits and hours by arrangement, up to a maximum of six credits. Consent of Department Head required prior to the student’s departure.
Special topics taken in a foreign study program.
Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).
Origin and distribution of the elements and their isotopes. Chemical reactions among naturally occurring solids, liquids, and gases. Geochronological and thermochronological analyses. Principles of symmetry and crystal chemistry and the identification of minerals by hand sample, petrographic and x-ray methods. Description of the mineralogy and texture of igneous, sedimentary, and metamorphic rocks and the application of contemporary petrographic and x-ray methods. Writing of a formal thesis based on independent research conducted by the student.

**Geophysics**

264Q. Physics of the Earth's Interior
First semester. Three credits. Prerequisite: PHYS 132 or 142, CHEM 128, MATH 114 or 116. **Cormier**

The composition, structure, and dynamics of the earth's core, mantle, and crust; seismic waves, Earthquakes, the earth's magnetic field, geochronology; radioactivity, and the earth's internal heat.

2660. The Earth, Moon, and Planets
Second semester. Three credits. Prerequisite: PHYS 132 or 142, CHEM 128, and MATH 210 (or 211 or 221), or consent of instructor. **Cormier**

The earth's gravity field and figure of the earth; wobbles of the earth's axis, the earth-moon system and tidal friction; orbital paths of planets, moons, and artificial satellites; compositions of planets and moons; development of the solar system.

**Health Systems Management (HSMG)**

**Director:** Jeffrey A. Kramer  
**Center Office:** Room 315, School of Business Administration

For major requirements, see the School of Business Administration section of this Catalog.

Health Systems courses are open to juniors and seniors only.

280. Introduction to Health Systems
First semester. Three credits. Prerequisite: PHYS 210 and HSMG 280, or consent of instructor.

This course introduces basic concepts, principles, and practices associated with the health care delivery system in the United States. The course will examine how this system is organized, and discuss the major issues related to the provision of health care, from both a business and social science perspective. Emphasis will be placed on understanding the components and features of the health care delivery system in the United States as it is developed and applied through a managed care organizational framework.

281. Health Systems Analysis
Second semester. Three credits. Prerequisite: PHYS 210 and HSMG 280, or consent of instructor.

This course deals with the application of economic theory, health services research, policy development and analysis, operations research, and management science techniques for analyzing and evaluating the performance of health care services and organizations.

282. Health Systems Planning and Design
First semester. Three credits. Prerequisite: HSMG 281 and 290, or consent of instructor.

This course is designed to develop skills and understanding of the strategic planning process and the design of health care organizations. The integrative course will cover topics in the areas of environmental analysis, strategic responses to change in the health care environment, and plan evaluation. In addition, this course will focus on the application of strategic planning concepts and principles to the design and development of health care information systems and technologies.

283. Advanced Topics in Health Systems Analysis

Discussion and empirical analysis of current issues, trends, and techniques related to the field of health systems management. Emphases on international comparisons of health care markets and institutions, efficiency of the U.S. health care system, and evaluation of public and private health care initiatives.
285. **Clinical and Social Issues in Health Care**
First semester. Three credits.
This course covers clinical and social issues affecting health care provider organizations, such as the health needs of special population groups, public health concerns, epidemiological issues, and health care quality. Discussion will include how health care organizations address such issues through methods including clinical studies, disease management, partnership between private and public sectors, and legislative initiatives.

290W. **Internship in Health Systems**
Either or both semesters. Six credits. Hours by arrangement. Prerequisite: OPIM 203 and 204, senior standing, and consent of instructor. It is recommended that students complete OPIM 210 prior to the internship.
Supervised field work in a health care organization where students work with health care professionals to expand their expertise in solving health systems problems and increase their awareness of the issues involved in the day to day operations of a health care institution. Student performance will be evaluated on the basis of an appraisal by the field supervisor and a detailed written report submitted by the student.

298. **Special Topics**
Either semester. Credits and hours by arrangement. Prerequisite: Announced separately for each offering. With a change in content, may be repeated for credit.
Classroom course in special topics in health systems management as announced in advance for semester.

299. **Independent Study for Undergraduates**
Either or both semesters. Credits by arrangement; not to exceed six in any semester. Open only with consent of instructor.
Individual study of special topics in health systems management as mutually arranged between a student and an instructor.

**History (HIST)**

*Head of Department: Professor Altina L. Waller*
*Department Office: Room 121, Wood Hall*
*For major requirements, see the College of Liberal Arts and Sciences section of this Catalog.*

100. **The Roots of the Western Experience**
Either semester. Three credits.
An analysis of the traditions and changes which have shaped Western political institutions, economic systems, social structures and culture in ancient and medieval times.

101. **Modern Western Traditions**
Either semester. Three credits.
History of political institutions, economic systems, social structures, and cultures in the modern Western world.

106. **The Roots of Traditional Asia**
Either semester. Three credits.
A survey of the early development and staying power of the traditional cultures from which the major societies of modern Asia have evolved.

108. **Modern World History**
Either semester. Three credits. Omara-Otunno
A survey of the historical experiences of the world’s major civilizations during recent centuries with particular attention to the modernization of the traditional cultures of Asia, Latin America, and Africa.

121. **Women in History**
Either semester. Three credits. Brown
The historical roots of challenges faced by contemporary women as revealed in the European and/or American experience: the political, economic, legal, religious, and family life of women.

198. **Varieties of History**
Either semester. Three credits. With a change in content may be repeated for credit.
A major topic in history through contemporary sources and historical interpretations.

200W. **Senior Thesis in History**
Either semester. Three credits. Hours by arrangement. Open only with consent of instructor and Department Head. Independent study authorization form required. Prerequisite: three credits of independent study and/or advanced seminar.

201. **Supervised Field Work**
Either semester. Credits up to 12. No more than six credits will count toward the department’s major requirements. Hours by arrangement. Open only with consent of Department Head.
Internship in applied history.

203W. **History and the Historian**
First semester. Three credits. Cox, Langer
Major historical theories and writings from the ancient world to the modern era. For History Honors and other qualified students.

204. **Medieval Islamic Civilization to 1700**
First semester. Three credits. Recommended preparation: HIST 100 or 101. Open to sophomores. Azimi
The social dynamics of faith, culture, and change from the rise of Islam to the Ottoman decline and the Islamic challenge to Greek and Latin Christendom.

205. **The Modern Middle East from 1700 to the Present**
Second semester. Three credits. Open to sophomores. Azimi
Tradition, change, modernization and development in the Middle East from the Ottoman decline and rise of successor states to the Arab-Israeli and oil crises.

206. **Introduction to the History of Science**
(Also offered as SCI 206.) First semester. Three credits. Open to sophomores. This course may be used only once to meet the distribution requirement. Roe
Rise and development of scientific inquiry: case studies designed to illustrate problems and methods in the study of the history of science.

207W. **Science and Social Issues in the Modern World**
Second semester. Three credits. Roe
Social context of science in the United States and Europe since 1850. Genetics and eugenics; ecology and the environment; nuclear issues; gender, race, and science.

208W. **Darwinism in the Modern World**
First semester. Three credits. Roe
Interaction of science, ideology, and world view in the development of evolutionary biology from Darwin to the present, including interrelations of genetics, eugenics, ecology, and sociobiology.

209. **History of the Family**
(Also offered as HDFR 279.) Either semester. Three credits. Not open for credit to students who have passed HDFR 279. Brown
Pre-industrial and industrial family life in Western society since the Middle Ages, with emphasis on the changes in demography, family size and structure, family economy, social expectations, sex roles, sexuality, and affective bonds.

210. **History of Women and Gender in Early America**
(Also offered as WS 210.) Either semester. Three credits. Not open to students who have taken HIST 202 or WS 202 before fall 1998. Dayton
Comparing the evolving gender systems of native American groups, transplanted Africans, and immigrant Europeans up to the early Nineteenth Century. Topics include women’s work, marriage and divorce, witch-hunting, masculinity, and women’s Revolutionary War roles. For U.S. women’s history, 1790 to present, see History 215.

211. **The Historian’s Craft**
Either semester. Three credits. Open to sophomores. Learning critical reading, thinking and writing skills by interpreting a variety of primary sources.

212W. **Near Eastern Pre-History**
(Also offered as Anthropology 257W.) Second semester. Three credits. Not open for credit to students who have passed ANTH 257.
From the earliest hunter-gatherers to the rise of the state: the transition from food-gathering to food-producing and the development of complex societies in the Near East.

213. **Ancient Near East**
(Also offered as CLAS 253.) Either semester. Three credits.
The history of Near Eastern civilization from the Neolithic period to the Persian Empire. The birth of civilization in Mesopotamia and Egypt. The political, economic, social, and cultural achievements of ancient Near Eastern peoples.

214. **Ancient Greece**
(Also offered as CLAS 254.) Either semester. Three credits.
The history of Greece from Minoan and Mycenaean times into the Hellenistic period with special emphasis on the Fifth Century and the “Golden Age” of Athens.

214W. **Ancient Greece**

215. **History of Women and Gender in the United States, 1790-Present**
(Also offered as Women’s Studies 215.) Either semester. Three credits. Not open for credit to students who have taken HIST 202 or WS 202 before fall 1998. Porter-Benson
Women and gender in family, work, education, politics, and religion. Impact of age, race, ethnicity, region, class, and affective preference on women’s lives. Changing definitions of womanhood and manhood.

216. **Ancient Rome**
(Also offered as CLAS 255.) Either semester. Three credits.
From the beginning of Rome to the reign of Justinian. The growth of the Roman Republic and Empire, Roman civilization and its influence upon later history.

216W. **Ancient Rome**

217. **World of Late Antiquity**
(Also offered as CLAS 243.) Either semester. Three credits.
The profound social and cultural changes that redefined the cities, frontiers, and economies of the classical world and led to the Middle Ages. Developments in the eastern and western
218. Palestine Under the Greeks and Romans
(Also offered as Hebrew 218 and Classics 256.) Either semester. Three credits. Recommended preparation: HIST 213 or 214 or 216 or INTD 294 or HEB 202. Miller
The political, historical and religious currents in Greco-Roman Palestine. Includes the Jewish Revolts, sectarian developments, the rise of Christianity and the Talmudic academies.

219. Early Middle Ages
First semester. Three credits. Olson
The decline of Rome, rise of Christianity, the barbarian invasions and kingdoms, culminating in the civilizations of the Carolingian Empire, of Byzantium, and of Islam.

220. The High Middle Ages
Second semester. Three credits. Olson
The history of Europe from the tenth through the fourteenth centuries. The development and expansion of European civilization, the revival of a money economy and town life, the development of feudal monarchy, the conflict of Empire and Papacy, the Crusades.

221. Modern China
Either semester. Three credits. Wang
Survey of patterns of modern China since 1800. Topics will include reforms and revolutions, industrialization and urbanization, and family and population growth.

222. History of Pre-Colonial Africa
First semester. Three credits. Omara-Orumu
The history of pre-colonial Africa with particular attention to the rise and fall of African kingdoms, interaction between different ethnic groups, African trade with other continents, and the impact of foreigners on African societies.

223. History of Modern Africa
Second semester. Three credits. Omara-Orumu
The history of African perceptions of and responses to the abolition of the slave trade, Western imperialism and colonialism, and the development of nationalism and struggle for independence.

224. History of Pan-Africanism
Second semester. Three credits. Recommended preparation: At least one of the following, HIST 222, 223, 238, or 246. Omara-Orumu
The development of ideas of Pan-Africanism, beginning with the proto-Pan-Africanists in the nineteenth century; examination of the linkages between those ideas in Africa and the evolution of Pan-Africanism as a movement in the African Diaspora.

225. History of War in the Modern World
Selected topics analyzing the interactions of warfare, military theories and practice with social, economic and technological developments since 1815.

226. Contemporary World Issues
Either semester. Three credits. Open to sophomores.
The historical background of, and approach to, a number of the most critical problems confronting the world since World War II.

227. Social History of Connecticut
First semester, even-numbered years. Three credits. Either 239 or 227, but not both, may be counted for credit toward the History major.
Everyday life from the Colonial Period to the recent past. Topography, Indians, settlement patterns, agriculture, industry, immigration and ethnic patterns, urbanization and suburbanization. Especially recommended to students planning to teach elementary grades.

228. Europe in the Nineteenth Century
First semester. Three credits. Open to sophomores. Recommended preparation: HIST 101. Coons
This course examines the Restoration, the mid-century revolutions, and the forces of nationalism, liberalism and imperialism. New social and economic movements and currents of thought are described and explored.

229. Europe in the Twentieth Century
Twentieth Century Europe and its world relationships in the era of two world wars, the great depression, and the cold war.

230. Europe in the Twentieth Century
231. American History to 1877: A Survey
Either semester. Three credits. Open to sophomores. Historical, political, social, and economic development of the American people from Reconstruction to the present.

231W. American History to 1877: A Survey
Second semester. Three credits. Brown
This course stresses the impact of political, economic, and social changes on American thought.

232. American History Since 1877: A Survey
Either semester. Three credits. Open to sophomores. Political, social, and economic development of the American people from Reconstruction to the present.

233. Social and Intellectual History of the United States through the Civil War
First semester. Three credits. Prerequisite: HIST 231 or consent of instructor. Brown
This course stresses the impact of political, economic, and social changes on American thought.

234. American Thought and Society since the Late Nineteenth Century
The interaction of popular ideas and formal thought with society in the United States during a time of worldwide crises and unrest. Social Darwinism, Populism, reformism, racism, radicalism, liberalism, conservatism, and other ideologies and movements.

235. Constitutional History of the United States
The Constitution and the Supreme Court in relation to the political, economic, and intellectual history of the United States.

236. Civil War America
The social, economic and cultural forces that shaped the Civil War and its aftermath. Sectional conflict, industrialization, reform and abolitionism, race relations, and class, gender and constitutional issues from the 1830s to the 1880s.

237. The Indian in American History
Either semester. Three credits. Recommended preparation: HIST 231. Shoemaker
Examination of the cultural and political/military interaction of Indians and Europeans in America from the early colonial period.

238. African American History to 1865
Either semester. Three credits. Ogbar
History of African-American people to 1865, from their West African roots, to their presence in colonial America, through enslavement and emancipation. Adaptation and resistance to their conditions in North America. Contributions by black people to the development of the United States.

239. History of Africa
Either semester. Three credits. Recommended preparation: HIST 231 or 232. Either 239 or 227, but not both, may be counted for credit toward the History major.
A survey of Connecticut’s history from 1633 to the present from a constitutional and political perspective.

240. History Workshop: Topics in American Society and Culture
Techniques of primary historical research based on collaborative research and writing on a topic selected by the instructor. With a change in content, may be repeated for credit.

241. The History of Urban America
(Also offered as Urban Studies 241.) Either semester. Three credits. Not open for credit to students who have passed URBN 241. Stave
The development of Urban America with emphasis on social, political, physical, and environmental change in the industrial city.

241W. The History of Urban America
(Also offered as Urban Studies 241W.)

242. Work and Workers in American Society
Either semester. Three credits. Porter-Benson
Changes in work from the 17th through the 20th centuries. Workers’ experiences, ideologies, and activities as shaped by gender, race/ethnicity, region, occupation, and industry.

243. The Establishment of the American Colonies
First semester. Three credits. Recommended preparation: HIST 231. Dayton, Shoemaker
Examines the context in which Europeans undertook settlement of North America, and the nature of the Indian response. Emphasis on the development of social, political, and religious institutions in the seventeenth century and in the increasingly ethnically and racially mixed cultures of the eighteenth century.

243W. The Establishment of the American Colonies.

244. The American Revolution
Creation of the United States of America from the beginnings of the independence movement through the adoption of the Constitution and Bill of Rights.

245. African American History Since 1865
Either semester. Three credits. Ogbar

246. African American History Since 1865

247. Immigrants and the Shaping of American History
The origins of immigration to the United States and the interaction of immigrants with the social, political, and economic life of the nation after 1879, with emphasis on such topics as nativism, assimilation, and the "ethnic legacy.

248W. **Main Currents in American Law**
Second semester. Three credits. Consent of instructor required. Dayton
Seminar, limited to fifteen, emphasizing class participation. Themes from 18th to 20th century include: the Americanization of English common law; developments in legal education and law practice; legal ideology from sociological jurisprudence to legal realism to critical legal studies.

249. **History of American Foreign Relations**
Either semester. Three credits. Recommended preparation: HIST 231 or 232 Costigliola
The United States in the world since the eighteenth century, with emphasis on twentieth-century events, doctrines, and leaders, expansion and decline of the American empire, world wars, Cold War, and Third World intervention.

250. **Byzantium**
Second semester. Three credits. Langer
A survey of the major developments from the fourth through the fifteenth centuries: religious controversies, the theme system, the Crusades, Byzantine civilization, its law, art, literature, and its impact upon European and Russian civilization.

251. **Medieval and Imperial Russia to 1855**
First semester. Three credits. Langer
The development of Russia from the emergence of the Slavs to the reign of Alexander II. Russian political institutions, orthodoxy and cultural traditions, nobility, peasantry, and townsfolk.

252. **History of Russia Since 1855**
Second semester. Three credits. Recommended Preparation: HIST 251 Langer
Continuation of History 251. Late imperial Russia, the former Soviet Union, and contemporary Russia.

254W. **The Habsburg Monarchy and Its Peoples, 1740-1918**
Second semester. Three credits. Recommended preparation: HIST 101 Coons
The rise and fall of the multinational, dynastic state of the Habsburgs, with emphasis upon those forces which sustained it through the nineteenth century and those which brought its collapse in 1918.

255. **Germany from the Reformation to 1815**
First semester. Three credits. Bergmann
A political and cultural survey of German history with topical emphasis on the Reformation, the religious wars, the Age of Enlightenment, the rise of Brandenburg-Prussia, Germany during the revolutionary era.

255W. **Germany from the Reformation to 1815**
Second semester. Three credits. Bergmann
A study of German political, social, and intellectual history since the Napoleonic Wars. This course also considers European and world problems as reflected in the emergence of Germany as a pivotal force in international affairs.

256. **Germany Since 1815**
Second semester. Three credits. Bergmann
The thought and feeling of Europeans in their social context.

258W. **Intellectual and Social History of Europe in the Nineteenth Century**
Second semester. Three credits. Bergmann
A continuation of HIST 258.

259W. **Intellectual and Social History of Europe in the Twentieth Century**
First semester. Three credits. Open to sophomores. Olson
A survey of English history from its origin to the close of the Tudor period. Emphasis is placed on the development of the English nation and the growth of its culture. Recommended to majors in English.

260. **History of Modern England**
Second semester. Three credits. Open to sophomores. Watson
Cultural, political, economic, and intellectual development of modern Britain, with special emphasis on changing ideas of national identity.

261. **History of Ireland**
Either semester. Three credits. Canning
History of Ireland, with emphasis on the modern period. The rise of Irish nationalism, the Irish Liberal Revival, and the problems of Northern Ireland.

264. **Social and Economic History of Modern Britain**
First semester. Three credits. Watson
The change from an agrarian to an industrial society.

265. **History of Ireland**
Either semester. Three credits. Canning
History of Ireland, with emphasis on the modern period. The rise of Irish nationalism, the Irish Liberal Revival, and the problems of Northern Ireland.

266. **Social and Economic History of Modern Britain**
Second semester. Three credits. Canning
The medieval, renaissance and early modern formulation of gender roles will be examined in the context of changing sexual values, practice, and methods of disciplining sexuality.

267. **Italy 1250-1600**
Either semester. Three credits. Davis
Italy from the triumph of the city-state and the popolo grosso to the end of the Renaissance. The complex interrelationship between society and culture will be the focus of study. Not open to those who have taken HIST 268.

269. **The Modernization of Italy from 1815 to Present**
Second semester. Three credits. Open to sophomores. Davis
The modernization of Italy’s traditional sociopolitical and economic structure; Industrialization, unification, the liberal regime, fascism, and the republic.

270. **Variable Topics**
Either semester. Three credits. With a change in topic, may be repeated for credit. Prerequisites, required preparation, and recommended preparation vary.

271. **The Renaissance**
First semester. Three credits. Gounens
Europe in the fourteenth and fifteenth centuries.

272. **The Reformation**
Second semester. Three credits.
Europe in the sixteenth century with emphasis on religious developments, rise of the modern state, birth of science, expansion of Europe, and the Commercial Revolution.

273. **Europe in the Seventeenth Century**
First semester. Three credits.
Conflict of constitutionalism and absolutism, colonial expansion and rivalry, development of science, and the age of reason, the age of the baroque, the age of Louis XIV.

274. **Europe in the Eighteenth Century**
Second semester. Three credits.
Intellectual, political, and socioeconomic developments in Europe from 1713 to 1789.

275. **Latin America and the Great Powers**
First semester. Three credits. Goodwin
Great power diplomatic, commercial, and cultural relations with Latin America from the end of the colonial period to the present. Emphasis on the United States and Great Britain.

276. **Andean Societies**
Second semester. Three credits. Recommended preparation: HIST 281 or 282 Spalding
History of the geographical and social region occupied by the Inca Empire: pre-Columbian cultures, the period of Spanish colonial rule, and the modern Andean republics (primarily Ecuador, Peru, and Bolivia).

277. **Modern India**
Either semester. Three credits. Buckley
An introduction to the history of India from the Mughal and European invasions of the 16th Century to the present. India’s synthesis of Eastern and Western culture, traditional and new, will be the focus.

279. **France Since 1715**
Second semester. Three credits. Cox
The disintegration of the monarchical synthesis prior to and during the French Revolution; the attempts to harmonize French society under subsequent regimes.

280W. **Mexico in the Nineteenth and Twentieth Centuries**
The emergence of modern Mexico from independence to the present with emphasis on the Revolution of 1910.

281. **Latin America in the Colonial Period**
First semester. Three credits. Open to sophomores.
Pre-Columbian Civilization in America, the epoch of conquest and settlement, together with a study of the Ibero-Indian cultural synthesis which forms the basis of modern Latin American civilization.

282. **Latin America in the National Period**
Second semester. Three credits. Open to sophomores. Goodwin, Silvestrini
Representative countries in North, Central, and South America and the Caribbean together with the historic development of inter-American relations and contemporary Latin American problems.

283W. **The Hispanic World in the Ages of Reason and Revolution**
First semester. Three credits. Recommended preparation: HIST 281, Silvestrini
The transformation of Spanish America from the Bourbons in 1700, through the wars of independence and the struggle to build stable national states in the Nineteenth Century.

285. **Cuba, Puerto Rico, and the Spanish Caribbean**
First semester. Three credits. Silvestrini
Discovery and settlement, slavery and plantation economy, recent political and economic developments, and United States relations with the Spanish Caribbean.
286. Argentina and LaPlata Region
First semester. Three credits. Recommended preparation: HIST 281 or 282. Goodwin
Colonial heritage, social and economic transformation of Argentina, Uruguay and Paraguay, foreign relations and contemporary turmoil.

287. East Asia to the Mid-Nineteenth Century
First semester. Three credits. Wang
The major problems and issues of traditional Chinese and Japanese history and historiography. Special emphasis on the “Great Tradition” in ideas of both civilizations.

287W. East Asia to the Mid-Nineteenth Century
Either semester. Three credits. Wang

288. East Asia Since the Mid-Nineteenth Century
Second semester. Three credits. Wang
The reactions of East Asia to the Western threat, and the rise of Asian nationalism, communism, and fascism. Special attention to the tensions caused by the conflict of ideas.

288W. East Asia Since the Mid-Nineteenth Century
Either or both semesters. Three credits. Wang

289. War and Diplomacy in East Asia
First semester. Three credits.
European struggle for power in Asia since 1842, in the context of the rise of Japan and the reassertion of Chinese power.

290. The Middle East Crucible
First semester. Three credits. Azimi
Twentieth-century issues in the Middle East heartland with analysis focusing on the Ottoman heritage, nationalism, Arab-Israeli and other conflicts, Islam, oil, water, rapid sociopolitical change, trends in development, super-power rivalries, and the search for identity, independence, and peace with justice.

291. Personality and Power in the Twentieth Century
Second semester. Three credits. Dynamic leadership in historical crises, including, for example, Churchill, Roosevelt, Stalin, Hitler, DeGaulle, Kennedy, and Mao.

292W. Biography as History
Second semester. Three credits. Two class periods of 75 minutes. Open to sophomores.
What the lives of significant individuals reveal about major historical periods and themes. Variable topics.

293. Foreign Study
Either or both semesters. Credits and hours by arrangement. May be repeated for credit. Consent of department head required, normally to be granted before the student’s departure. May count toward the major with consent of the advisor.

294. Asian-American Experience Since 1850
Either semester. Three credits. Wang
Survey of Asian-American experiences in the United States since 1850. Responses by Asian-Americans to both opportunities and discrimination.

295W. History through Fiction
Either semester. Three credits. Open to sophomores. Recommended preparation: History 231 or 232 (if American perspective) or History 228 or 229 (if European perspective). Phillips
What classic novels and other works of fiction reveal about major historical periods and themes in history. Variable topics. May be offered from an American or European perspective.

296. Directed Research
Either or both semesters. Three credits. Open only to senior history majors. An introduction to research methods and resources in history.

297W. Senior Seminar
Either semester. Three credits. Required preparation: HIST 211. Open only to undergraduate history majors in their senior year. With a change in content, may be repeated for credit.
These seminars give students the experience of reading critically and in depth in primary and secondary sources, and of developing and defending a position as an historian does.

298. Special Topics
Either semester. Credits and hours by arrangement. With a change of content, may be repeated for credit. Prerequisites, required preparation, and recommended preparation vary.

299. Independent Study
Either or both semesters. Credits and hours by arrangement. Open only with consent of instructor. With a change in content, may be repeated for credit.

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Human Development and Family Relations (HDFR)

Dean: Charles M. Super
Program Office: Room 106, Family Studies Building

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190. Individual and Family Development
Either semester. Three credits. Human development throughout the life span, with emphasis upon the family as a primary context.

193. Courtship, Marriage, and Sexuality
Either semester. Three credits. Development of patterns of interaction in premarital and marital relationships.

197. Research Seminar
Either or both semesters. Three credits. Open to seniors. Option for writing a thesis. Topics to be announced.

198. Seminar
Either or both semesters. Three credits. Open to seniors. Option for writing a thesis. Topics to be announced.

199. Independent Study
Either or both semesters. Credits and hours by arrangement. Open only with consent of instructor. With a change in content, may be repeated for credit.

200. Introduction to Programs for Young Children
Either semester. Three credits. Open only with consent of instructor. Must be taken concurrently with HDFR 221 or HDFR 288 with a placement in a child care setting.
Components of programs designed for infants and young children. Guided observations and participation in a program for young children.

201. Programs for Young Children: Introduc-tory Laboratory
Either semester. One credit. One 2-hour laboratory by arrangement. Open only to students concurrently enrolled in HDFR 220 or HDFR 220W, and open only with consent of instructor.
Guided observation and participation in a program for young children.

202. Courts, Marriage, and Sexuality
Either semester. Three credits. Development of patterns of interaction in premarital and marital relationships.

203. Courtship, Marriage, and Sexuality
Either semester. Three credits. Development of patterns of interaction in premarital and marital relationships.

204. Human Development: Adulthood and Aging
Either semester. Three credits. Open to seniors. Option for writing a thesis. Topics to be announced.

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Either or both semesters. Three credits. Open to seniors. Option for writing a thesis. Topics to be announced.

199. Independent Study
Either or both semesters. Credits and hours by arrangement. Open only with consent of instructor. With a change in content, may be repeated for credit.
Continuation of HDFR 227. Experience in early childhood program implementation, administration, staff supervising, policy making, and curriculum planning.

230. Current Topics in Early Childhood Education
Semester and hours by arrangement. Variable credits. Open only with consent of instructor. With a change in content this course may be repeated for credit.

In-depth investigation of a current issue in early childhood education (e.g. emergent literacy, diversity), with focus on recent research and application to classroom practice. Includes classroom instruction and laboratory observation.

231. Infancy
Either semester. Three credits. Prerequisite: HDFR 202 or PSYC 236.

Human development from birth through the second year of life within the family setting.

234. Social and Personality Development During Childhood
Either semester. Three credits. Prerequisite: HDFR 202 or PSYC 236.

Social and personality development during infancy and childhood; influence of family members, peers, and social institutions on development; aggression, pro-social behaviors, autonomy, self-concept, sex-role development, and moral development.

234W. Social and Personality Development During Childhood
(Also offered as Anthropology 245.) Offered every third semester. Three credits. Not open for credit to students who have passed ANTH 245.

Theory and research on major dimensions of parenting in U.S.A. and cross-culturally: parental warmth, control and punishment.

248. Aging in American Society
(Also offered as Sociology 248.) Either semester. Three credits. Not open for credit to students who have passed SOCI 248.

Social gerontology: the role and status of older people in a changing society.

248W. Aging in American Society
(Also offered as Sociology 248W.)

250. Gender and Aging
Either semester. Three credits.

Aging process as it impacts on men and women; historical and cross-cultural perspectives, changing family roles, including grandparenthood and widowhood, and implications of changing gender roles for self-actualization of older persons.

250W. Gender and Aging

252. Death, Dying, and Bereavement
Either semester. Three credits.

Cultural context of death, personal meaning of death at different stages in life cycle, and the effect of death upon survivors.

252W. Death, Dying, and Bereavement

259. Men and Masculinity: A Social Psychological Perspective
Either semester. Three credits.

Men’s gender role socialization over the life span; men’s developmental issues, gender role, conflicts, and interpersonal dynamics with women. Theory, research, and personal exploration are integrated.

260. Woman: A Developmental Perspective
Either semester. Three credits.

Development of women and women’s roles from birth to maturity: physiological, psychological, sociological, and interpersonal systems which contribute to development of women across the life span; cross-cultural and alternative models for role development.

264. Legal Aspects of Family Life
First semester. Three credits. Not open for credit to students who have passed DRM 264.

Law in family life.

266. Introduction to Counseling
Either semester. Three credits.

Principles of professional counseling including therapeutic processes, roles, and skills. How counselors help people solve problems is explored. Student’s psychological growth and development is facilitated through psychological education.

269. Family Violence
Either semester. Three credits.

Theory, research, prevention, and treatment concerning the multiple forms of violence within contemporary families. The impact of violence on families and family members over the entire life span is considered. Includes child abuse and neglect, courtship violence, spouse abuse, elder abuse, and rape.

270. Low Income Families
Either semester. Three credits.

Impact of poverty and related problems on development of the child in the context of the family. Family structure, childrearing patterns, early educational and community programs.

271. Black American Family Patterns
Either semester. Three credits.

Continuities and discontinuities between black American subcultural patterns and dominant cultural norms as reflected by black American families.

272. Family and Work
Either semester. Three credits.

Interaction of the world of work with family structure; social psychological dynamics that enhance or impede working families’ lives.

273. Family Interaction Processes
Either semester. Three credits.

Family interaction: communication processes, bonding behaviors, management of conflict and aggression, negotiation of family crisis.

274. Public Policy and the Family
Either semester. Three credits. Not open for credit to students who have passed DRM 274.

Analysis of government programs and policies impacting the family: child care, aging, family law, mental health, family violence, income maintenance, and family impact analysis.

275. Family Pathology
Either semester. Three credits. Prerequisite: HDFR 273.

Theory, research and intervention in families under stress.

276. Planning and Managing Human Service Programs
Either semester. Three credits.

Planning techniques: needs assessment, data collection and analysis, budgeting, and evaluation. Management skills: decision making, management theory and organizational behavior, personnel motivation, accountability, and financial management.

276W. Planning and Managing Human Service Programs

277. Issues in Human Sexuality
Either semester. Three credits.

Contemporary issues concerning human sexuality; impact upon individuals and family units.

278. Family in Society
Either semester. Three credits. Not open for credit to students who have passed DRM 280.

Sociocultural and historic variability of family and kinship systems. Race, class, gender and ethnicity as those advantage or disadvantage the opportunity structure for families and individuals. Effect of public policy on the quality of family life.

278W. Family in Society

279. History of the Family
(Also offered as History 209.) Second semester. Three credits. Not open for credit to students who have passed HIST 209.

Preindustrial and industrial family life in Western society since the Middle Ages; changes in demography, family size and structure, family economy, social expectations, sex roles, sexuality, and affective bonds.

280. Material Culture in American Family Life
Either semester. Three credits. Not open for credit to students who have passed DRM 280.

Material culture of the American family; interaction between family members and the artifacts in their near environment; role of personal possessions, household objects, housing and diet in daily family life and rituals over time.

281. Comparative Family Policy
Second semester. Three credits.

Comparative analysis of government programs and policies impacting families in the United States and other countries. Health and welfare policies, family planning, child care, teen pregnancy, and care of the aged.

284. Adolescence: Youth and Society
Either semester. Three credits. Prerequisite: HDFR 202 or HDFR 203 or PSYC 236.

Contemporary adolescence, the multiple forces and behavioral characteristics of this period of development.

287. Parenthood
Either semester. Three credits.

Parent behavior and the dynamics of parenthood; interpersonal, familial, and societal roles of parents and variables influencing these roles.

287W. Parenthood

288. Supervised Field Experience
Either semester. Three or six credits. May be repeated up to a maximum of six credits. Prerequisites: HDFR 201, Major GPA 2.5; Upper Division GPA 2.5; 15 credits of 200 level HDFR courses completed; and consent of the field worker coordinator. Students who do not meet all of these requirements may take the course with the consent of the fieldwork coordinator and of the seminar instructor. Weekly seminar required. Practicum by arrangement.
289. Fieldwork in Community Settings
Either semester. Three credits. Prerequisite: HDFR 288; Major GPA 2.5; Upper Division GPA 2.5; and consent of fieldwork instructor. Cannot be repeated for credit. Cannot be used towards meeting major requirements in HDFR nor towards meeting GPA requirements in HDFR. Weekly seminar required. Practicum by arrangement.

Supervised participation in settings where purposes and functions are related to the development and welfare of individuals and families.

290. Research Methods in Human Development and Family Relations
Either semester. Three credits. Prerequisite: HDFR 190 and PSYC 132 and 133. Open only to Human Development and Family Relations majors.

Research methods used in human development and family relations.

290W. Research Methods in Human Development and Family Relations

292. Research Practicum in Human Development and Family Relations
Either semester. Credits and hours by arrangement. Prerequisites: Division GPA of 2.5 and consent of the instructor. May be taken more than one semester.

Supervised experience conducting research in human development and family relations.

294. Foreign Study
Either or both semesters. Credits and hours by arrangement. Consent of Director of Undergraduate Studies required, preferably prior to student’s departure. With a change in content, this course may be repeated for credit.

Special topics taken in a foreign study program.

298. Selected Topics in Human Development and Family Relations
Either semester. Three credits. Open only with consent of instructor. With a change in content this course may be repeated for credit.

299. Independent Study for Undergraduates
Either or both semesters. Credits and hours by arrangement. Open only with consent of instructor. May be taken more than one semester.

Students, working with a faculty supervisor, develop plans for an independent research project or review paper, execute the project, and complete a report.

Interdepartmental (INTD)

100. The Social Consequences of Engineering in the Modern World
Either semester. Three credits. Not open to students in the School of Engineering.

This course offers non-engineering students desiring an understanding of the role of engineering in the world today opportunities to get acquainted with various engineering disciplines and significant issues. These include mechanical and solar energy, nuclear power, computers, genetics and urbanization taught by a team of interdisciplinary specialists relating engineering to problems of the real world in an understandable, non-technical manner.

130. Africa and Latin America: The Challenge of Poverty, Violence, and Development
Either semester. Three credits.

A study of poverty, violence, and development in two major Third World regions, and the causes and consequence of these interrelated factors. Strategies for change and their effects on jobs, income distribution, modernization, indigenous and external relations, food, agriculture, industrialization, urbanization, inflation, political and military structures, and human rights will be examined.

132. World Studies and Human Resource Development
Either semester. Three credits.

A comparative exploration of three major world cultures (Chinese, Latin American, and Middle Eastern) which relates to the themes of authority, legitimacy, and loyalty in each. Third World perspectives and development issues will be emphasized.

180. FYE University Learning Skills
Either semester. One credit. One class period. Open to freshman and sophomore students only.

A component of the First Year Experience (FYE) program, this course is intended to acquaint students with the university and expand their learning experiences in order for them to adjust to the new expectations they will face. The course involves assignments that will provide opportunities for students to enhance their academic and interpersonal skills.

181. FYE Learning Community Seminar
Either semester. One credit. One class period. Open to freshman and sophomore students only. This course must be taken in combination with a cluster of three courses; with the permission of the instructor, one of the cluster courses may have been completed previously. With a change in content, this course may be repeated for credit.

A component of the First Year Experience (FYE) program, this seminar course is intended to provide an opportunity to integrate the consideration of material from three courses through discussion, assignments, and projects. Students will have opportunities to enhance their academic and interpersonal skills.

182. FYE Faculty/Student Seminar
Either semester. One credit. One class period. Open to freshman and sophomore students only. With a change in content, this course may be repeated for credit.

A component of the First Year Experience (FYE) program, this seminar course is intended to provide an opportunity for students to investigate topics of professional interest to the faculty instructor through guided research or reading, discussion, and writing. The course will help students learn independently and engage actively in the academic life of the university.

193. Foreign Study
Either or both semesters. Credits and hours by arrangement. May be repeated for credit (to a maximum of 15). Consent of appropriate area studies director required before departure.

Course work undertaken within approved Study Abroad programs, usually focusing on the history, culture, and society of a particular country.

195. Interdisciplinary Special Topics Lecture Course
Either semester. Credits and hours as determined by the Senate Curricula and Courses Committee. May be repeated for credit with a change in topic.

196. Interdisciplinary Special Topics Seminar
Either semester. Credits and hours as determined by the Senate Curricula and Courses Committee. Open only with consent of instructor. May be repeated for credit with a change in topic. This course may or may not count for credit toward graduation. Students should consult the course syllabus and the Dean’s Office of their School or College.

197. Interdisciplinary Special Topics
Independent Study
Either semester. Credits and hours as determined by the Senate Curricula and Courses Committee. Open only to freshmen and sophomores with consent of instructor. May be repeated for credit with a change in topic.

198. Freshman Honors Seminar
First semester. One credit. One class period. Open only with consent of Honors Director.

A overview of some aspects of university education. Designed to help students set learning goals to be achieved during the baccalaureate experience.

200. An Interdisciplinary Approach to Health Care
First semester. Three credits. Open only with consent of instructors. This course is also listed under Nursing and Pharmacy, Gillespie, Infante, and Staff.

An interdisciplinary approach to health care which focuses on the role of the health team in the health care delivery system. Emphasis is placed on the preparation and roles of the health team members, both independent and interdependent, the system of health care delivery in the nation, modes of communication and collaboration, and the role of the consumer of health care.

210. Urban Field Studies
Either semester. Nine credits. Hours by arrangement. Open only with consent of the director of the Urban Semester Program. Must be taken concurrently with INTD 211 and 212. This course is also listed under Sociology. Sponsored by the Urban Semester Program. Director of the Urban Semester Program Field experience supervised by the director and an examining committee consisting of the director and two or more faculty members from two departments in the College of Liberal Arts and Sciences.

211. Seminar in Urban Problems
Either semester. Three credits. Hours by arrangement. Open only with consent of the Director of the Urban Semester Program. Must be taken concurrently with INTD 210 and 212. Sponsored by the Urban Semester Program. Director of the Urban Semester Program Discussions based upon assigned readings and led by invited speakers from within the University.

212. Urban Semester Field Work Seminar
Either semester. Three credits. Hours by arrangement. Open only with consent of the Director of the Urban Semester Program. Must be taken concurrently with INTD 210 and 212. Sponsored by the Urban Semester Program. Director of the Urban Semester Program Students make analytic presentations of their field experiences, relating these to the pertinent available literature. Particular urban problems are discussed with invited experts from outside the University.

212W. Urban Semester Field Work Seminar

220. Studies in the Culture of the Middle Ages
Second semester. Three credits. Open only with consent of the instructor of record. With a change in content this course may be repeated for credit. Sponsored by the Committee for Medieval Studies.

An interdisciplinary examination of various aspects of the culture of Medieval Europe. Instructors and content will vary. Particulars will be announced prior to registration for the semester in which the course is offered.