929A Planar Waveguides and Circuits
Fall of odd years. Spring of odd years. 3(3-0) RB: (ECE 835) SA: EE 929A

929B Antenna Theory
Fall of odd years. Spring of odd years. 4(4-0) RB: (ECE 835) SA: EE 929B

929C Geometrical Theory of Diffraction
Fall of odd years. Spring of odd years. 3(3-0) RB: (ECE 835) SA: EE 929C

931 Advanced Topics in Electronic Devices and Materials
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course. SA: EE 931
Topics vary each semester.

931A VLSI Technology
Fall of odd years. Spring of odd years. 3(3-0) RB: (ECE 875) SA: EE 931A
Oxidation, doping techniques, simulation techniques, film deposition and etching, epitaxial growth, lithography, passivation, and packaging.

931B Microdevices and Microstructures
Fall of odd years. Spring of odd years. 3(3-0) RB: (ECE 875) SA: EE 931B

931C Properties of Semiconductors
Fall of odd years. Spring of odd years. 3(3-0) RB: (ECE 874) SA: EE 931C
Carrier scattering, single particle and collective transport, quantum effects, hot electron effects, electron-photon and electron-phonon interactions.

932 Advanced Topics in Analog Circuits
Spring of odd years. 3(3-0)
Variable topics in advanced circuit analysis.

960 Advanced Topics in Control
Fall, Spring. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. RB: (ECE 827 and ECE 829) SA: EE 960
Topics vary each semester.

960A Adaptive Control
Fall of odd years. Spring of odd years. 3(3-0) RB: (ECE 827 and ECE 829) SA: EE 960A

960B Nonlinear Control
Fall of odd years. Spring of odd years. 3(3-0) RB: (ECE 827 and ECE 829) SA: EE 960B

963 Advanced Topics in Systems
Fall, Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. SA: EE 963
Topics vary each semester.

963A Sensor Fusion and System Identification and Observation
Fall of odd years. Spring of odd years. 3(3-0) RB: (ECE 826) SA: EE 963A
Model parameterization, adaptive filters, identifiability criteria, equation and output error methods, recursive algorithms, least squares and maximum likelihood identification, convergence analysis, closed-loop system identification, experiment design.

963B Intelligent Control in Robotics and Automation
Fall of odd years. Spring of odd years. 3(3-0) RB: (ECE 818 and ECE 826) SA: EE 963B
Robot dynamics, different formulations. Control types: joint space, task space, force and compliance, robust control. Coordination of multiple robots, mobile robots.

963C Adaptation and Learning in Neural Networks and Systems
Fall of odd years. Spring of odd years. 3(3-0) RB: (ECE 885) SA: EE 963C
Analysis, design. Learning algorithms. Stability, convergence. Possible engineering applications.

966 Advanced Topics in Signal Processing
Fall, Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. SA: EE 966
Topics vary each semester.

966A Discrete Time Processing of Speech Signals
Fall of odd years. Spring of odd years. 3(3-0) RB: (ECE 468 and ECE 863 and ECE 864) SA: EE 966A

966B Multidimensional Signal Processing
Fall of odd years. Spring of odd years. 3(3-0) RB: (ECE 466 and ECE 864) SA: EE 966B

966C Advanced Topics in Statistical Signal Processing
Fall of odd years. Spring of odd years. 3(3-0) RB: (ECE 466 and ECE 863 and ECE 864) SA: EE 966C
Communication channels, noise models, hypothesis testing of signals by Bayesian minimax, and Neyman-Pearson criteria. Performance evaluation using ROC, Bayesian and maximum likelihood parameter estimation. Kalman-Bucy filtering.

989 Advanced Topics in Plasma
Fall of odd years. Spring of odd years. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. SA: EE 989
Topics vary each semester.

989A Plasma Processing for IC Fabrication
Fall of odd years. Spring of odd years. 3(3-0) RB: (ECE 835 and ECE 850) SA: EE 989A
Process requirements. Plasma reactors. Etching and deposition applications. Broad ion beam processing.

999 Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 72 credits in all enrollments for this course. SA: EE 999
Doctoral dissertation research.

ENGINEERING  EGR

College of Engineering

101 Preview of Science
Fall. 1(1-0) Interdepartmental with Natural Science; Agriculture and Natural Resources; Social Science. Administered by Natural Science; R: Approval of college.

124 Internet and Technology
Fall, Spring, Summer. 2(2-0)
The Internet from a user perspective and from a technical perspective. History and social impact of the Internet. Internet tools.

150 Engineers and the Engineering Profession
Spring. 2(2-0) R: Open only to freshmen or sophomores.

160 Diversity and Engineering
Fall, Spring. 2(2-0) P.M: (MTH 116 or concurrently or MTH 132 or concurrently) R: Open only to freshmen or sophomores in the College of Engineering.

192 Environmental Issues Seminar
Fall, Spring. 1 credit. A student may earn a maximum of 4 credits in all enrollments for this course. Interdepartmental with Natural Science; Agriculture and Natural Resources; Social Science; Communication Arts and Sciences. Administered by Natural Science. R: Open only to students in the College of Agriculture and Natural Resources or College of Engineering or College of Natural Science or College of Communication Arts and Sciences or College of Social Science. Approval of college.
Environmental issues and problems explored from a variety of perspectives, including legal, scientific, historical, political, socio-economic, and technical points of view.
290 Independent Study
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 4 credits in all enrollments for this course. R: Open only to students in the College of Engineering, approval of college.
Independent undergraduate research in engineering.

291 Selected Topics
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 4 credits in all enrollments for this course. R: Open only to freshmen or sophomores.
Experimental course development or special topics appropriate for freshmen and sophomores.

300 Technology, Society and Public Policy
Fall. 2(2-0) P.M: Completion of Tier I writing requirement. RB: Two courses in mathematics or engineering or science. SA: EGR 200, MSM 300

393 Engineering Cooperative Education
Fall, Spring, Summer. 1(1-0) A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to students in the College of Engineering. Pre-professional educational employment experiences in industry and government related to student's major. Educational employment assignment approved by College of Engineering.

400 Special Problems in International Engineering
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to juniors or seniors or graduate students in the College of Engineering. Supervised study of selected topics in engineering using laboratories, equipment, and engineering design techniques. Given at various international universities and institutes.

410 System Methodology
Spring. 2(1-3) P.M: (EGR 300) SA: SYS 410, MSM 400
System analysis and design. Needs analysis, system identification, graphical models. Team project required.

475 Special Topics in International Engineering
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to juniors or seniors or graduate students in the College of Engineering. Topics selected to supplement regular courses. Given at various international universities and institutes.

888 Capstone Project in Manufacturing
Fall, Spring, Summer. 3(1-6)
Interdepartmental with Marketing and Supply Chain Management. Administered by Department of Marketing and Supply Chain Management. R: Open only to seniors in the Manufacturing Engineering major or to students in the Business Management of Manufacturing major. Problem solving in manufacturing. Design of products and processes for manufacturing using a systems approach. Teaming and communication skills are emphasized.

ENGLISH

Department of English
College of Arts and Letters

092 Academic Oral Skills for Non-Native Speakers of English
Fall, Spring. 0(3-0) R: Approval of English Language Center.
Intensive speaking and listening practice of spoken academic English. Lecture-listening and note-taking strategies. Oral communication skills improved through discussions and classroom presentations.

093 Academic Reading and Writing Skills for Non-Native Speakers of English
Fall, Spring. 0(6-0) R: Approval of English Language Center.
Integrative reading and writing strategies for academic purposes. Vocabulary development, intensive and extensive reading, and critical reading skills. Academic writing style and editing strategies.

094 Academic Reading Skills for Non-Native Speakers of English
Fall, Spring. 0(3-0) R: Approval of English Language Center.
Intensive and extensive reading skills. Vocabulary development, pre-reading strategies, reading for comprehension, and critical reading skills.

095 Academic Writing Skills for Non-Native Speakers of English
Fall, Spring. 0(3-0) R: Approval of English Language Center.
Writing, editing, and revision of journals, essays and research papers.

097 Oral Skills for Foreign Teaching Assistants
Fall, Spring. 0(5-0) R: Approval of English Language Center.
Practice in English skills for classroom instruction. Pronunciation. Presentations and handling questions. Managing student interactions and classroom situations.

101 Cross-Cultural Literature
Fall, Spring, Summer. 4(4-0)
Fiction, drama, or poetry of major authors, written in or translated into English, reflecting a broad range of cultures.

106 Contemporary Life Through Literature
Fall, Spring, Summer. 4(4-0)
Contemporary literature written since 1945 exploring issues in modern life. Personal or public, artistic or political, natural or cultural.

108 Children's Literature and Literature for Young Adults
Fall, Spring, Summer. 4(4-0)
Children's literature and different genres of literature for young adults, including realistic and historical fiction, modern fantasy, myth, legend, poetry, and nonfiction.

110 The Comic Impulse in Narrative, Drama, and Film
Fall, Spring, Summer. 4(4-0)
Comedy from classical literature to the present, drawing on novels, drama, films and humorous verse. Humor and its relation to culture.

120 Great Books of Western Literature
Fall, Spring, Summer. 4(4-0)
Literary texts of varied eras and genres that have exerted enduring influence on English and related literatures.

121 Shakespeare on Page and Screen
Fall of odd years. 4(4-2)
Shakespearean plays emphasizing productions for film and television.

130 Film and Society
Fall. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. SA: ENG 370
How films reflect social issues of gender, ethnicity, class, sexual orientation and handicap status. How film affects and shapes social attitudes.

142 Chillers and Thrillers: Introduction to Popular Literary Genres
Fall, Spring, Summer. 4(4-0)
Popular literary genres such as science fiction, romance, detective novels, and spy thrillers, including film and other non-print media.

153 Introduction to Women Authors
Fall, Spring. 4(4-0)
Writings by women from various racial, socio-economic and historical backgrounds. Women's choices of subject matter and style. Women's redefinition of literary genres.

203 Genres and Themes
Fall, Spring. 3(3-0) R: Not open to students in the Department of English or American Studies major or English disciplinary minor.
Texts organized by genre and theme with attention to the historical and cultural perspectives which define them.

204 Readings in North American Literatures
Fall, Spring. 3(3-0) R: Not open to students in the Department of English or English disciplinary minor.
Selected texts from North American literatures drawn from a variety of historical periods, genres, and cultures, reflecting the diversity of North American experiences.

205 Readings in British Literatures
Fall, Spring. 3(3-0) R: Not open to students in the Department of English or English disciplinary minor.
Selected texts from British literatures drawn from a variety of genres and historical periods, reflecting the diversity of human experiences and the continuity of human concerns.