

Electrical and Computer Engineering—ECE

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

Technology, modeling and simulation of submicron solid state devices. Microsensors and micromachining. Diamond and superconducting devices. Vacuum microelectronic structures.

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

Model reference adaptive control in continuous and discrete time. Lyapunov and hyperstability approaches, adaptive observers, self-tuning regulators, design using pole-zero assignments. Minimum variance and LQG control.

960B Nonlinear Control

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

Relay control, stabilizing controllers. Design via variable structure, high gain, geometric, and Lyapunov-based methods. Feedback linearization and tracking controls.

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.

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 466 and ECE 863 and ECE 864) SA: EE 966A

Digital speech models. Short term temporal processing. Linear predictive and spectral analysis. Speech coding and synthesis, recognition, enhancement.

966B Multidimensional Signal Processing

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

Multidimensional signals and systems concepts. Two-dimensional sampling, windowing, filter design. Fast algorithms for convolution and transforms. Sensor array processing. Interpolation.

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.

160 Diversity and Engineering

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

Diversity and engineering. Transitional problems. Career options. Communication skills.

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 College of 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.

ENGINEERING EGR

College of Engineering

101 Preview of Science

Fall. 1 credit. Interdepartmental with Natural Science; Agriculture and Natural Resources; Social Science. Administered by College of Natural Science. R: Approval of college.

Overview of natural sciences. Transitional problems. Communications and computer skills. Problem-solving skills. Diversity and ethics problems in science. Science and society.

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) P: (MTH 116 or concurrently or MTH 132 or concurrently) or (LBS 118 or concurrently) R: Open only to freshmen or sophomores.

Overview of the engineering profession. Historical background. Engineering specialties. Engineers at work. Professionalism and ethics. Communication skills. Future trends and challenges.

292 Applications in Environmental Studies

Fall. 2(1-2) Interdepartmental with Natural Science; Agriculture and Natural Resources; Communication Arts and Sciences; Social Science. Administered by College of Natural Science. P: (NSC 192) R: Open only to students in the Specialization in Environmental Studies.

Community engagement project. Projects vary depending on student's major and area of environmental interest.

300 Technology, Society and Public Policy

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

Defining, describing and analyzing technology. Impact of technology on society. Public policy and technology. Short history of technology. Development and use of assessment tools to measure impact and consequences of technology.

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: (EGR 300 and STT 351) and (ECE 345 or concurrently and ME 222 or concurrently) R: Open only to students in the Applied Engineering Sciences major. 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.
- 490 Independent Study (W)**
Fall, Spring, Summer. 1 to 4 credits. R: Open only to juniors and seniors in the College of Engineering. Approval of the College of Engineering.
Individualized reading, research, and/or project.
- 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.
- 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(3-2) 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 handicapper 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, Summer. 4(4-0)
Writings by women from various racial, socio-economic and historical backgrounds. Women's choices of subject matter and style. Women's re-definition 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.
- 206 Readings in Contemporary Literatures**
Fall, Spring. 3(3-0) R: Not open to students in the Department of English or English disciplinary minor.
Selected texts of various genres from contemporary literatures written in English, reflecting the diversity of human experiences.
- 210 Introduction to the Study of English**
Fall, Spring. 4(4-0) P: Completion of Tier I writing requirement. R: Open only to students in the Department of English or American Studies major or English disciplinary minor or Language Arts major.
Production, interpretation, and dissemination of texts in their political, religious, economic, social, and literary contexts. Critical methodologies and writing about texts and modes of discourse.
- 211H Honors Foundation in Literary Studies**
Fall, Spring. 4(4-0) R: Open only to Honors College students or with approval of department.
Literary form and textual analysis. Literary theory and critical methodology. Questions of historical and cultural context.
- 221 Introduction to Shakespeare**
Fall, Spring. 3(3-0) R: Not open to students in the Department of English or English disciplinary minor.
Selected plays chosen to represent the different periods and genres of Shakespeare's career.
- 223 Introduction to Creative Non-Fiction Writing**
Fall, Spring. 3(3-1) P: (ENG 210)
Directed practice in the writing of creative non-fiction. Types and structures available to the creative non-fiction writer.
- 226 Introduction to Creative Writing**
Fall, Spring. 3(3-1) P: Completion of Tier I writing requirement. R: Not open to English majors.
Major forms and methods of creative writing: fiction, poetry, drama, narrative essay, and film.
- 228 Introduction to Fiction Writing**
Fall, Spring. 3(3-1) P: (ENG 210)
Directed practice in the writing of fiction. Types and structures available to the fiction writer.
- 229 Introduction to Poetry Writing**
Fall, Spring. 3(3-1) P: (ENG 210)
Directed practice in the writing of poetry. Types and structures available to the poetry writer.
- 230 Introduction to Film**
Fall, Spring. 4(4-2) P: Completion of Tier I writing requirement. SA: ENG 270
Basic concepts and techniques of film analysis and criticism.
- 231 Film and Literature**
Spring. 4(4-2) P: (ENG 230 or ENG 210) and completion of Tier I writing requirement. R: Not open to freshmen or sophomores. SA: ENG 473
Differences and similarities between filmic texts and literary texts and between viewing and reading. The process of adaptation from literature to film.

ENGLISH

ENG

Department of English
College of Arts and Letters**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.