

866. Digital Signal Processing
Spring. 3(3-0) Interdepartmental with
Computer Science.
P: EE 466, EE 863.
Review of elementary DSP concepts. Transform algorithms. Filter design and implementation. Adaptive filters. Spectrum estimation. Applications.
QP: EE 466, EE 456

874. Physical Electronics
Fall. 3(3-0)
Applications of quantum mechanics and statistical mechanics in solids. Band theory of semiconductors. Electrical transport phenomena. Pn junctions.
QA: EE 874, EE 875

875. Electronic Devices
Spring. 3(3-0)
P: EE 874.
Operating properties of semiconductor devices including DC, AC, transient and noise models of FET, BJT, metal-semiconductor contact, heterostructure, microwave and photonic devices.
QP: EE 474 QA: EE 875, EE 876

885. Artificial Neural Networks
Fall. 3(3-0) Interdepartmental with Computer Science.
Overview of neuro-engineering technology. Basic neural network architectures. Feedforward and feedback networks. Temporal modeling. Supervised and unsupervised learning. Implementation. Basic applications to pattern recognition.

899. Master's Thesis Research
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 24 credits in all enrollments for this course.
QA: EE 899

921. Advanced Topics in Digital Circuits and Systems (MTC)
Fall, Spring. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. Interdepartmental with Computer Science. Topics vary each semester. Topics such as testable and fault-tolerant digital systems, embedded architectures.
QP: EE 809, EE 813

925. Advanced Topics in Power (MTC)
Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. Topics vary each semester. Topics such as advanced stability and control of power systems, power system planning, or advanced machine drives.
QP: EE 823, EE 824 QA: EE 920

929. Advanced Topics in Electromagnetics (MTC)
Fall, Spring. 3 to 4 credits. A student may earn a maximum of 10 credits in all enrollments for this course. Topics vary each semester. Topics such as planar waveguides and circuits, antenna theory, geometrical theory of diffraction.
QP: EE 837 QA: EE 929

931. Advanced Topics in Electronic Devices and Materials (MTC)
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course. Topics vary each semester. Topics such as VLSI technology, microdevices and microstructures, properties of semiconductors.
QP: EE 874 QA: EE 932

932. Advanced Topics in Analog Circuits (MTC)
Spring of even-numbered years. 3(3-0) A student may earn a maximum of 3 credits in all enrollments for this course. Topics vary each semester. Topics such as advanced circuit analysis.

960. Advanced Topics in Control (MTC)
Fall. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. Topics vary each semester. Topics such as adaptive control, or nonlinear control.
QP: EE 826

963. Advanced Topics in Systems (MTC)
Fall, Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. Topics vary each semester. Topics such as system identification and adaptive filtering, robot dynamics and control, or learning in artificial neural networks.

966. Advanced Topics in Signal Processing (MTC)
Fall, Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. Topics vary each semester. Topics such as discrete time processing of speech signals, multidimensional signal processing, or detection and estimation theory.

989. Advanced Topics in Plasma (MTC)
Fall of odd-numbered years. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. Topics vary each semester. Topics such as plasma processing for IC fabrication, plasma diagnostic techniques.
QP: EE 850 QA: EE 989

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.
QA: EE 999

ENGINEERING EGR College of Engineering

150. Engineers and the Engineering Profession
Spring. 2(2-0)
R: Open only to freshmen and sophomores.
Overview of the engineering profession. Historical background. Engineering specialties. Engineers at work. Professionalism and ethics. Communication skills. Future trends and challenges.

160. Minority Engineering Education Seminar
Fall. 2(2-0)
R: Open only to freshmen in the College of Engineering and to freshmen no-preference students.
Issues relevant to underrepresented engineering minority groups. Diversity in engineering. Transitional problems. Communication skills. Career options.
QA: EGR 290

200. Technology, Society and Public Policy
Fall. 2(2-0)
P: 2 courses in mathematics or engineering or science.
R: Not open to freshmen.
Description and analysis of certain technologies and their consequences. Development of techniques for assessing consequences as an aid to formulation of public policy.
QA: EGR 200

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: Students in College of Engineering, approval of department.
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, sophomores.
Experimental course development or special topics appropriate for freshmen and sophomores.
QP: EGR 290

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 College of Engineering. Educational employment assignment approved by College of Engineering.
Pre-professional educational employment experiences in industry and government related to student's major.
QA: EGR 344

ENGLISH ENG Department of English College of Arts and Letters

090A. Intensive English for Non-Native Speakers
Fall, Spring. 0 credit. [12(20-0) See page A-2, item 3.]
R: Approval of English Language Center.
Explanation and intensive practice of English skills. Focus on beginning grammar, speaking, listening, reading, and writing.
QA: ENG 091, ENG 092, ENG 093, ENG 094, ENG 095

090B. Intensive English for Non-Native Speakers
Fall, Spring. 0 credit. [12(20-0) See page A-2, item 3.]
R: Approval of English Language Center.
Explanation and intensive practice of English skills. Focus on intermediate grammar, speaking, listening, reading, and writing.
QA: ENG 091, ENG 092, ENG 093, ENG 094, ENG 095

090C. Intensive English for Non-Native Speakers
Fall, Spring. 0 credit. [12(20-0) See page A-2, item 3.]
R: Approval of English Language Center.
Explanation and intensive practice of English skills. Focus on advanced grammar, speaking, listening, reading, and writing.
QA: ENG 091, ENG 092, ENG 093, ENG 094, ENG 095

091. English Structure for Non-Native Speakers
Fall, Spring. 0 credit. [3(3-0) See page A-2, item 3.]
R: Approval of English Language Center.
Explanation and practice of advanced grammatical structures of English in relation to written communication. Emphasis on editing skills.
QA: ENG 091

092. Academic oral Skills for Non-Native Speakers of English
Fall, Spring. 0 credit. [3(3-0) See page A-2, item 3.]
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.
QA: ENG 092

093. Academic Reading and Writing Skills for Non-Native Speakers of English
Fall, Spring. 0 credit. [6(6-0) See page A-2, item 3.]
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.
QA: ENG 094, ENG 095

094. Academic Reading Skills for Non-Native Speakers of English
Fall, Spring. 0 credit. [3(3-0) See page A-2, item 3.]
R: Approval of English Language Center.
Intensive and extensive reading skills. Vocabulary development, pre-reading strategies, reading for comprehension, and critical reading skills.
QA: ENG 094