

## Descriptions —Electrical Engineering of Courses

### 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.

### 920. **Selected Topics in High Performance Computer Systems**

Spring of odd-numbered years. 3 credits. A student may earn a maximum of 9 credits in all enrollments for this course. Interdepartmental with Computer Science. Administered by Computer Science.

P: CPS 822. R: Open only to Computer Science or Electrical Engineering majors.

Design of high performance computer systems. Seminar format.

### 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.

### 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.

### 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.

### 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.

### 932. **Advanced Topics in Analog Circuits (MTC)**

Spring of odd-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.

### 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.

### 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.

## ENGINEERING

### College of Engineering

#### 101. **Preview of Science**

Fall. 1(1-0) Interdepartmental with Natural Science, Agriculture and Natural Resources, and Social Science. Administered by 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.

#### 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.

#### 192. **Environmental Issues Seminar**

Fall, Spring. 1(1-0) A student may earn a maximum of 4 credits in all enrollments for this course. Interdepartmental with Natural Science, Agriculture and Natural Resources, and Social Science. Administered by Natural Science.

R: Open only to students in the College of Agriculture and Natural Resources, College of Engineering, College of Natural Science, and 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.

#### 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.

#### 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.

#### 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.

#### 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, seniors, and 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.

#### 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, seniors, and 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**

Spring. 3(1-6) Interdepartmental with Marketing and Supply Chain Management.

R: Open only to juniors or 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

## 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.

#### 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.