

**866. Digital Signal Processing**  
Spring. 3(3-0) Interdepartmental with  
Computer Science.  
P: EE 466, EE 863.  
Review of elementary DSP concepts. Transform algo-  
rithms. 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 includ-  
ing DC, AC, transient and noise models of FET, BJT,  
metal-semiconductor contact, heterostructure, micro-  
wave and photonic devices.  
QP: EE 474 QA: EE 875, EE 876

**885. Artificial Neural Networks**  
Fall. 3(3-0) Interdepartmental with Com-  
puter Science.  
Overview of neuro-engineering technology. Basic  
neural network architectures. Feedforward and feed-  
back networks. Temporal modeling. Supervised and  
unsupervised learning. Implementation. Basic applica-  
tions 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 architec-  
tures.  
QP: EE 809, EE 813

**925. Advanced Topics in Power (MTC)**  
Spring. 3(3-0) A student may earn a maxi-  
mum 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, prop-  
erties 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 maxi-  
mum 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 tech-  
niques.  
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. Transition-  
al 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 enroll-  
ments 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 communi-  
cation. 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 academ-  
ic purposes. Vocabulary development, intensive and  
extensive reading, and critical reading skills. Academ-  
ic 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