

**Descriptions — Electrical Engineering  
of  
Courses**

**442. Systems Concepts for Biologists**  
*Winter. 3(3-0) Approval of department.*  
Basic concepts of systems science important to formal analysis and control of biological communities, with emphasis on modeling and on analysis of behavior through numerical solutions.

**810. Introduction to Linear System Theory**  
*Fall. 3(3-0)*  
A first course in system theory for students from a range of disciplines. Mathematical representation of system variables, transform and state space method of analysis, introduction to control theory, applications to physical, economic and social systems.

**811. System Methodology and Simulation**  
*Winter. 3(3-0) SYS 810, STT 441.*  
Problem definition, design of abstract models for system design and control, simulation of systems described by differential and difference equations, generation of random variables, simulation of discrete object stochastic systems, simulation languages, applications to physical, economic and social systems.

**814. Advanced System Methodology and Simulation**  
*Spring. 3(3-0) SYS 811.*  
Simulation of a class of time-varying distributed parameter processes; organization and design of large simulation models; optimization and parameter estimation in large simulation models; applications to economic, social and biological systems; other topics of current interest.

**835. Static Optimization Methods**  
*Summer. 4(4-0) MTH 424.*  
Linear and nonlinear optimization examples and applications; Kuhn-Tucker theory; saddle point optimality conditions; algorithms for problems with constraints; unconstrained optimization; introduction to search methods.

**843. Ecosystem Analysis, Design and Management**  
*Spring. 3(3-0) SYS 442. Interdepartmental with the Department of Zoology.*  
Groups of students from various biological and nonbiological disciplines will synthesize and analyze models of selected biological systems. Project should yield information relevant to solution of contemporary ecological problems.

**ENGINEERING EGR**

**College of Engineering**

**150. Engineers and the Engineering Profession**  
*Spring. 3(3-0)*  
Overview of the engineering profession. Historical background. Engineering specialties. Engineers at work. Professionalism and ethics. Communication skills. Future trends.

**200. Technology, Society and Public Policy**  
*Winter. 3(3-0) Twelve credits from natural science or engineering. Interdepartmental with the Department of Natural Science.*  
Description and analysis of certain current technologies and their consequences; exploration of avenues for assessing such consequences as an aid to formulation of public policy.

**290. Selected Topics**  
*Fall, Winter, Spring, Summer. 1 to 3 credits May reenroll for a maximum of 6 credits if different topics are taken.*  
Experimental course developments or special topics appropriate for freshmen and sophomores.

**344. Engineering Cooperative Education**  
*Fall, Winter, Spring, Summer. Zero credits. [3 credits-See page A-1, item 3.] May reenroll for a maximum of ten terms. Employment assignment approved by College of Engineering.*  
Pre-professional employment in industry and government related to student's major.

**390. Value Engineering**  
*Fall. 4(4-0) Engineering Arts juniors, approval of department.*  
The basis of value engineering is function, value, and a group of special techniques developed to aid in isolating and identifying problems created by our complex society and technology.

**401. Engineering and Public Policy**  
*Spring. 3(3-0) Seniors or approval of department. Interdepartmental with the Department of Natural Science.*  
Sociotechnical assessment of impact of technology on society, with analysis of the role of engineering and natural science in contributing to public policy formulation.

**ENGLISH ENG**

**College of Arts and Letters**

**091. English for Foreign Students—Structures**  
*Fall, Winter, Spring, Summer. Zero credits. [3(5-0) See page A-1 item 3.] English language proficiency examination.*  
Explanation and intensive practice of basic grammatical structures of English. Students are tested and then placed in small groups, from beginning to advanced, depending on their need.

**092. English for Foreign Students—Speaking and Listening**  
*Fall, Winter, Spring, Summer. Zero credits. [3(5-0) See page A-1 item 3.] English language proficiency examination.*  
Intensive speaking and listening practice of spoken English in small groups (determined by proficiency). For beginners, practice is largely drill. Advanced groups use drill, films, discussion, and practical conversations.

**093. English for Foreign Students—Language Laboratory**  
*Fall, Winter, Spring, Summer. Zero credits. [3(5-0) See page A-1 item 3.] English language proficiency examination.*  
Language laboratory practice in small groups (determined by proficiency). Beginnings review and supplement ENG 091, ENG 092. Advanced groups use carefully prepared lectures, speeches, and presentations to practice structures and vocabulary.

**094. English for Foreign Students—Reading**  
*Fall, Winter, Spring, Summer. Zero credits. [3(5-0) See page A-1 item 3.] English language proficiency examination.*  
Intensive and extensive reading in small groups (determined by proficiency). Beginners emphasize vocabulary development and practice in basic structures. Advanced classes include reading skills, wider reading, and specialized vocabulary.

**095. English for Foreign Students—Writing**  
*Fall, Winter, Spring, Summer. Zero credits. [3(5-0) See page A-1 item 3.] English language proficiency examination.*  
Frequent controlled and free writing in small groups to reduce errors and practice using structures and vocabulary to express ideas. Advanced classes include writing styles used in academic course work.

**101. Responses Through Writing**  
*Fall. 4(4-0) Arts and Letters Freshmen only. Students must enroll in and complete ENG 102 satisfactorily to make a substitution for the American Thought and Language requirement.*  
A writing workshop that concentrates on the students' personal writing voice and on their responses to the things, people, and institutions central to their experience.

**102. Writing and Composing**  
*Winter. 5(5-0) ENG 101; Arts and Letters Freshmen only.*  
A continuation of ENG 101 that develops the emphases of ENG 101 and encourages students to write in more public and objective forms—narrative, critical analysis, and issue-oriented essays.

**104. Writing for Science Majors**  
*Fall. 3(3-0) Satisfactory grade in English proficiency exam; College of Natural Science majors. Interdepartmental with the Department of American Thought and Language.*  
Writing workshop for science students that develops and refines composition ability.

**105. The Scientist as Writer**  
*Winter. 3(3-0) ENG 104. Interdepartmental with the Department of American Thought and Language.*  
Study of various types of writing by scientists—fiction, poetry, and autobiography as well as professional papers and books. Students will write frequently about the readings.

**106. Introductory Scientific Writing**  
*Spring. 3(3-0) ENG 105. Interdepartmental with the Department of American Thought and Language.*  
Writing of popular essays, scientific papers and reports, and other papers related to science.

**200H. Honors Work**  
*Fall, Winter, Spring. 1 to 16 credits. Approval of department.*

**201. Nature of Language**  
*Fall, Winter, Spring, Summer. 3(3-0)*  
Various aspects of language—phonology and orthography; morphology, semantics and the lexicon; syntax; and dialects—with special reference to American English.

**205. Introduction to Shakespeare**  
*Fall, Winter, Spring. 3(3-0) Not applicable to major or minor requirements.*  
A study of selected plays illustrating the powers of England's greatest writer.