

Electrical and Computer Engineering—ECE

- 457 Communication Systems**
Spring. 3(3-0) P:M: (ECE 302 and ECE 366 and STT 351) R: Open only to juniors or seniors or graduate students in the Department of Electrical and Computer Engineering. SA: EE 457

Representation and processing of signals in the presence of noise. System performance. Modulation, detection, and coding of information. System design applications in radar, sonar, radio, television, satellite communications, digital telephony, and wireless systems.

- 458 Communication Systems Laboratory**
Spring. 1(0-3) P:M: (ECE 303 and ECE 457 or concurrently) SA: EE 458

A projects laboratory in communication systems.

- 466 Digital Signal Processing and Filter Design**

Fall. 3(3-0) P:M: (ECE 366) R: Open only to seniors or graduate students in the Department of Electrical and Computer Engineering. SA: EE 466

Discrete Fourier transforms, sampling theorem, circular convolution, Z-transforms. Design of infinite impulse resistance filters using prototypes and algorithmic methods. Design of finite impulse resistance filters by windowing, frequency sampling.

- 474 Principles of Electronic Devices**
Fall, Spring. 3(3-0) P:M: (ECE 302 and ECE 305) SA: EE 474

Energy levels in atoms. Crystal properties, energy bands and charge carriers, semiconductors, transport properties of bulk materials. P-n junction diodes, bipolar transistors, field effect transistors.

- 476 Electro-Optics**
Fall, Summer. 4(3-3) P:M: (ECE 302 and ECE 303 and ECE 305) R: Open only to juniors or seniors or graduate students in the Electrical Engineering major and juniors or seniors in the Computer Engineering major. SA: EE 476

Operational theory, characteristics and applications of optical components, light emitting diodes, lasers, laser diodes, photodetectors, photovoltaics, fiber optics, optical modulators and non-linear optical devices.

- 477 Microelectronic Fabrication**
Fall. 3(2-3) P:M: (ECE 474 or concurrently) R: Open only to juniors or seniors in the Department of Electrical and Computer Engineering. SA: ECE 483

Microelectronic processing fundamentals and simulations. Comparison of current microfabrication technologies and their limitations.

- 480 Senior Design**
Fall, Spring. 5(3-6) P:M: (ECE 303 and ECE 313 and ECE 320 and ECE 331 and ECE 366) or (CSE 410 and CSE 420) and completion of Tier I writing requirement. R: Open only to seniors in the Department of Electrical and Computer Engineering. SA: ECE 481, ECE 482, ECE 483

Electrical engineering and computer engineering senior design experience involving contemporary design tools and practices, engineering standards, ethics, cross-functional teaming, oral and written technical communication, lifelong learning.

- 484 Applications of Analog Integrated Circuits**
Spring. 4(3-3) P:M: (ECE 302 and ECE 303) R: Open only to juniors or seniors or graduate students in the Department of Electrical and Computer Engineering. SA: EE 484

Circuit design using analog integrated circuits. SPICE macromodeling. Operational amplifiers, comparators, timers, regulators, multipliers and converters. Design project with hardware and software verification.

- 485 Digital Control and Robotics**
Spring. 4(3-3) P:M: (ECE 331 and ECE 313) R: Open only to juniors or seniors or graduate students in the Department of Electrical and Computer Engineering. SA: EE 485

Robot classifications, kinematics, trajectory planning, digital controller design. Design and implementation of sensor-based robots.

- 490 Independent Study**
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 3 credits in all enrollments for this course. R: Approval of department. SA: EE 490

Independent study of a topic in electrical engineering or computer engineering.

- 491 Special Topics**
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to students in the Department of Electrical and Computer Engineering. SA: EE 491

Investigation of special topics in electrical engineering or computer engineering.

- 499 Undergraduate Research**
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 4 credits in all enrollments for this course. R: Approval of department. SA: EE 499

Independent undergraduate research in contemporary areas of electrical engineering or computer engineering.

- 150 Engineers and the Engineering Profession**
Spring. 2(2-0) 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.

- 160 Diversity and Engineering**
Fall, Spring. 2(2-0) P:M: (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.

- 300 Technology, Society and Public Policy**
Fall. 2(2-0) P:M: 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.

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.

- 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:M: (EGR 300) 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.

- 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:M: 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:M: (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:M: 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:M: (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:M: (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:M: 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:M: (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.
- 232 Writing as Exploration**
Fall, Spring, Summer. 3(3-1) Summer: Detroit and GR areas. P:M: Completion of Tier I writing requirement. R: Not open to English majors.
Study and writing of non-fiction prose that reflects on experience, individual and social. Autobiography and personal essay.
- 265 Classical Myths and Literature**
Fall. 3(3-0) P:M: Completion of Tier I writing requirement. R: Not open to freshmen.
Greek myths that have been wrought into later poetry, fiction, drama, painting, sculpture, and music.
- 266 Literary Interpretation of the Bible**
Spring. 3(3-0) P:M: Completion of Tier I writing requirement. R: Not open to freshmen.
Selections from the Old and New Testaments. Emphasis on major themes, genres, characterizations, and styles.

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.
- 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.