sil and nuclear fuels; energy consumption analysis; energy management and conservation techniques; renewable and alternative energy sources. Modern energy conversion devices such as fuel cells, photovoltaic cells, and micro-power turbines. Prerequisite: ENTC 3420. Spring.

ENTC 4336. RELIABILITY AND MAINTENANCE OF INDUSTRIAL EQUIPMENT
3 sem. hrs. (3:0)
Process industrial equipment, equipment reliability, basic stress analysis of pressure vessel elements, welding technology in repair and fabrication, fitness for service, failure mechanisms, major inspection and vessel codes, material selection, preventive, and predictive maintenance, fault tree and root cause analysis, CMMS, implementing TPM and technical and management issues. Prerequisite: ENTC 3408. Spring.

ENTC 4350. CAPSTONE PROJECTS
3 sem. hrs. (1:5)
This course allows students to employ the knowledge attained in other courses to implement (including building, testing, and documenting) the approved project in ENTC 4315, within budget and on schedule. Course requirements include a written report and oral presentations. To be taken the student’s final semester before graduation. Prerequisite: ENTC 4415. Spring.

ENTC 4360. MECHANICAL SYSTEM DESIGN
3 sem. hrs. (3:0)
Analysis, management and cost, team work, optimal design, and computer simulation of mechanical systems and components; Applications in fluid flow and heat transfer, machine elements, and stress analysis. Selected course topics are included as computer programming projects. Prerequisite: ENTC 4432. Fall.

ENTC 4415. PROJECT JUSTIFICATION AND MANAGEMENT
4 sem. hrs. (3:2)
Foundations of engineering economy, cash flow and equivalence, and project justification. Introduction to project management, planning, scheduling, and control, use of project management software, GANTT charts, PERT charts, critical path. Students prepare proposals, including specifications, timelines, schedule, and budget, for projects to be implemented in ENTC 4350. This course should be taken the semester preceding ENTC 4350. Prerequisite: Senior standing. Fall.

ENTC 4420. EMBEDDED SYSTEMS
4 sem. hrs. (3:3)
Characteristics of embedded systems, system design, interface devices, memory management, interrupt support, input/output applications, software-hardware co-design, modular programming, multitasking, simulation, and control of external devices. Prerequisites: ENTC 3416 and ENTC 3418. Fall.

ENTC 4430. POWER TRANSMISSION & DISTRIBUTION
4 sem. hrs. (3:3)
This course covers principles of power transmission and distribution. Topics include unbalanced distribution; point to point measurements, operation control of systems; power systems; transmission lines; fault analysis; line modeling and unit analysis. Prerequisites: ENTC 3415.

ENTC 4432. DESIGN OF MACHINE ELEMENTS
4 sem. hrs. (3:3)
Nature of mechanical design, stress deformation analysis, design of different types of machine elements such as flexible mechanical elements, gears, fasteners and welded joints, springs bearings, shafts, brakes, clutches, and couplings using conventional and computer aided design tools. Prerequisite ENTC 3408. Fall.

ENTC 4446. CONTROL SYSTEMS I
4 sem. hrs. (3:3)
Introduction to control systems; open and feedback; Laplace transform and frequency response; control valves; electric motors; P, PI, and PID modes of control; analog and digital controllers Process characteristics; analysis of control systems; gain and phase margin; stability. Prerequisites: ENTC 3444. Spring.

ENTC 4448. CONTROL SYSTEMS II
4 sem. hrs. (3:3)
Continuation of Control Systems I; Control systems design; controller mode selection; control loop tuning; data acquisition systems; distributed control systems; supervisory control; data transmission; networks; analysis and specification of complete control systems. Prerequisite: ENTC 4446. Fall.

ENTC 4465. INDUSTRIAL SAFETY AND ACCIDENT PREVENTION
4 sem. hrs. (4:0)
An introduction to OSHA and standards development for occupational health in general industry. Special attention to chemicals, flammable liquids and fire protection; industrial accident prevention; safe plant layout, safety in maintenance; boilers and pressure vessels; design of machine guards; toxic material handling and storage; industrial health engineering; power tools; biological, radiation, chemical, welding and electrical hazards; Nature of risk and human error; system and software hazard analysis.

ENTC 4490. SELECTED TOPICS
1-4 sem. hrs.
Subject material variable. May be repeated for credit when topics are different. Prerequisites: Vary depending upon topic. Offered on demand.

ENTC 4496. DIRECTED INDEPENDENT STUDY
1-4 sem. hrs.
Requires a formal proposal of study to be completed in advance of registration, approval of supervising faculty and chairperson. Prerequisites: Vary depending upon area of study. Offered on demand.

ENTC 4697. CO-OP/INTERNSHIP
1-6 sem. hrs.
Supervised off campus training in the industrial workplace. Oral and written report required. Prerequisite: Approval of Engineering Technology and Cooperative Education Coordinators prior to enrollment in the course. Offered on demand.

ENGLISH (ENGL)

ENGL 0399. FUNDAMENTALS OF WRITING
3 sem. hrs.
A portfolio-based course focused on the writing process, including conferencing, pre-writing, revision, and editing techniques. Students will enter English 0399 through TASP-mandated remediation. (Not counted toward graduation.)

ENGL 1301 (ENGL 1301) COMPOSITION I
3 sem. hrs.
Principles, techniques, and processes of written composition, textual analysis, and critical thinking. Satisfies the University core curriculum requirement in composition.
A course designed to help students gain practical experience in finding and interpreting information and writing reports and documents for specialized audiences in the professional world. ENGL 3301 will be held in a computer-assisted classroom. Satisfies the university core curriculum requirement in literature. Prerequisites: ENGL 1301 and 1302.

ENGL 3320. 3 sem. hrs. THE BIBLE AS LITERATURE
A consideration of the Bible and its development over time as an anthology of texts, including its influence on the literature of the Anglo-American tradition. For all majors. Prerequisites: ENGL 1302 and ENGL 2332, 2333, 2334, or 2335.

ENGL 3321. 3 sem. hrs. FILM AND LITERATURE
Studies the connections between the formal elements of literature and of film, with emphasis on theme, narrative style, and genre. By viewing films based on literary sources, students will analyze how literature is adapted into film as well as identify strategies to view and read critically. For all majors. Prerequisites: ENGL 1302 and ENGL 2332, 2333, 2334, or 2335.

ENGL 3322. 3 sem. hrs. LITERARY PERSPECTIVES ON CHILDREN’S FICTION AND POETRY
Literary study of children’s literature through reading, analysis, discussion and interpretation. The course emphasizes issues connected with society, culture, history, and genre.

ENGL 3323. 3 sem hrs. LITERARY PERSPECTIVES ON YOUNG ADULT FICTION AND POETRY
Literary study of young adult literature through analysis, discussion, and interpretation. The course emphasizes literary issues connected with society, culture, history, and genre.

ENGL 3339. 3 sem hrs. INTRODUCTION TO LINGUISTICS
Introductory survey course covering phonetics, morphology, syntax, semantics, sociolinguistics, neurolinguistics, and language acquisition. Offered in Spring.

ENGL 3340. 3 sem. hrs. GRAMMAR
Presents a general descriptive overview of English grammar and provides a structural framework for analyzing English sentences.

ENGL 3341. 3 sem. hrs. LITERATURE OF THE ENGLISH RENAISSANCE
A study of significant works of poetry, prose, and non-Shakespearean drama from 1500 to 1660.

ENGL 3342. 3 sem. hrs. BRITISH LITERATURE BEFORE THE RENAISSANCE
A study of significant works of poetry, prose, and drama produced before the Renaissance, primarily from the Anglo-Saxon up to the Early Modern period.

ENGL 3345. 3 sem. hrs. BRITISH LITERATURE OF THE 19TH THROUGH 21ST CENTURIES
A study of selected poetry, drama, and prose of the 19th through 21st Centuries centuries from a cultural perspective.

ENGL 3348. 3 sem. hrs. DRAMA
A genre-oriented study of dramatic literature, using a wide range of texts. Variable content.

ENGL 3349. 3 sem hrs. THEMES AND FORMS OF POETRY
A genre-oriented study of poetry using a wide range of texts. Variable content.

ENGL 3353. 3 sem hrs. THE SHORT STORY
A study of the short story (mainly American) from its early beginnings in the mid-nineteenth century to present times.

ENGL 3354. 3 sem. hrs. AMERICAN LITERATURE: TO 1865
A study of significant works of American poetry, drama, and prose from the country’s pre-European beginnings to 1865, including both oral and written traditions.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 3355</td>
<td>3 hrs.</td>
<td>AMERICAN LITERATURE: LATE 19TH AND EARLY 20TH CENTURY</td>
<td>This course examines American poetry, drama, and prose from 1865 to 1945 with a focus on how these works reflect literary and cultural values.</td>
</tr>
<tr>
<td>ENGL 3356</td>
<td>3 hrs.</td>
<td>AMERICAN LITERATURE: SINCE 1945</td>
<td>This course examines American poetry, drama, and prose from 1945 to the present, with emphasis on the diversity of contemporary and postmodern American literature.</td>
</tr>
<tr>
<td>ENGL 3357</td>
<td>3 hrs.</td>
<td>READING AND WRITING AUTOBIOGRAPHY</td>
<td>A study of autobiographies (mainly American) that focuses on the history and theory of the genre. The course also provides opportunities for students to write creatively in the genre.</td>
</tr>
<tr>
<td>ENGL 3360</td>
<td>3 hrs.</td>
<td>CURRENT APPROACHES TO COMPOSITION &amp; LITERATURE</td>
<td>Significant contemporary approaches to written discourse in English, including the study of composition and literature. Prerequisite: One reading course.</td>
</tr>
<tr>
<td>ENGL 3361</td>
<td>3 hrs.</td>
<td>STRATEGIES AND GENRES OF ADVANCED WRITING</td>
<td>Practice in techniques and tactics of the sophisticated writer. Focus on rhetorical strategies that succeed in specific discourse situations, both academic and non-academic. Satisfies university computer literacy requirement.</td>
</tr>
<tr>
<td>ENGL 3362</td>
<td>3 hrs.</td>
<td>TECHNIQUES OF CREATIVE WRITING</td>
<td>Develops students’ theoretical knowledge and practical experience in using the techniques of creative writing. Focuses on poetry and short fiction. For all majors. Prerequisites: ENGL 1302 and ENGL 2332, 2333, 2334, or 2335.</td>
</tr>
<tr>
<td>ENGL 3366</td>
<td>3 hrs.</td>
<td>LANGUAGE IN SOCIETY</td>
<td>An introduction to the study of language as a function of several societal variables. Introduces basic concepts of language such as linguistic varieties, dialect, speech communities and linguistic attitudes.</td>
</tr>
<tr>
<td>ENGL 3368</td>
<td>3 hrs.</td>
<td>COMMUNITY LITERACY AND SERVICE LEARNING</td>
<td>The course explores how literacy is used in specific contexts, particularly in service-learning practices. It also focuses on how literacy is used as a way to construct knowledge, reflection, and action.</td>
</tr>
<tr>
<td>ENGL 3369</td>
<td>3 hrs.</td>
<td>TOPICS IN LINGUISTICS</td>
<td>Exploration of topics such as second language acquisition, language assessment, history of English, and contrastive analysis. May be repeated when topics vary.</td>
</tr>
<tr>
<td>ENGL 3375</td>
<td>3 hrs.</td>
<td>WRITING IN THE PROFESSIONS</td>
<td>Focuses on rhetorical theory in professional writing, such as the role of the audience and purpose, ethical decision making in professional writing, and the broad spectrum of types of professional writing. Students must make a C or better in ENGL 1301 or 1302 and must be able to type before enrolling in ENGL 3375. This course is held in a computer-assisted classroom. It cannot substitute for other writing classes required for students in their disciplines. Satisfies university computer literacy requirement.</td>
</tr>
<tr>
<td>ENGL 3378</td>
<td>3 hrs.</td>
<td>DESKTOP PUBLISHING</td>
<td>Focuses on the integration of text and visual rhetoric, such as graphics, for all kinds of professional publications including technical documents, newspapers, public relations pieces, and advertisements. Satisfies university computer literacy requirement.</td>
</tr>
<tr>
<td>ENGL 3379</td>
<td>3 hrs.</td>
<td>WRITING IN COMPUTER-NETWORKED ENVIRONMENTS</td>
<td>Emphasizes practical concepts related to writing and communication on the internet and the World Wide Web. Attention is given to finding and analyzing information; analyzing and designing WWW sites and other digital, hypertextual environments; and analyzing and composing hypermedia materials for digital, networked environments. For all majors. Satisfies university computer literacy requirement.</td>
</tr>
<tr>
<td>ENGL 3380</td>
<td>3 hrs.</td>
<td>ADVANCED WRITING IN COMPUTER-NETWORKED ENVIRONMENTS</td>
<td>Emphasizes practical concepts related to writing and communication in digital media and networked environments. Students will focus on planning, designing, and composing professional publications related to their area of study. Emphasizes theoretical as well as practical concepts related to writing and communication in digital networked environments, including the internet and the World Wide Web. For all majors. Satisfies university computer literacy requirement. Prerequisite: ENGL 3379 or permission of instructor.</td>
</tr>
<tr>
<td>ENGL 4304</td>
<td>3 hrs.</td>
<td>SHAKESPEARE: TEXTS AND CONTEXTS</td>
<td>A study of selected dramatic works by William Shakespeare. Plays are studied in the context of Renaissance culture, dramatic traditions, and stage history. Discussion topics include: textual production in the age of Shakespeare, the history of Shakespeare’s plays in print, and the role of collaboration in performance and interpretation. Offered in Spring.</td>
</tr>
<tr>
<td>ENGL 4305</td>
<td>3 hrs.</td>
<td>MAJOR AUTHORST</td>
<td>This course studies the significant works of a single, major author in the Western tradition. Texts are placed in the context of the writer’s life, of the society, culture, and history of the times, and will be viewed through a variety of critical perspectives.</td>
</tr>
<tr>
<td>ENGL 4311</td>
<td>3 hrs.</td>
<td>LITERATURE OF THE ENGLISH ROMANTIC PERIOD</td>
<td>A study of significant works of poetry and prose from 1790-1832, with attention to the cultural and intellectual background of the period.</td>
</tr>
<tr>
<td>ENGL 4312</td>
<td>3 hrs.</td>
<td>LITERATURE OF THE ENGLISH VICTORIAN PERIOD</td>
<td>A study of significant works of poetry and prose from 1832 to 1901, with attention to the cultural and intellectual background of the period.</td>
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</tbody>
</table>
ENGL 4313. BRITISH LITERATURE OF THE 20TH AND 21ST CENTURIES
A study of significant works of poetry, prose, and drama from 1901 to the present, with attention to the cultural and intellectual background of the period.

ENGL 4320. PROFESSIONAL WRITING WORKSHOP
Tailored for individual students’ writing and publishing projects in their disciplines such as article writing, instructional manuals, grant writing, and feasibility studies.

ENGL 4321. GRANT WRITING
Introduces students to the grant writing process and provides them with experience writing actual grant applications on behalf of local non-profit organizations.

ENGL 4330. CREATIVE WRITING WORKSHOP I
Develops students’ skills as critics and writers of fiction and poetry in a workshop setting. For all majors. Prerequisite: ENGL 3362 or permission of instructor.

ENGL 4335. CREATIVE WRITING WORKSHOP II
A continuation of ENGL 4330. For all majors. Prerequisites ENGL 3362 and ENGL 4330.

ENGL 4340. THE NOVEL

ENGL 4345. RHETORIC, LITERATURE, AND WRITING
This course examines the history and major theories of rhetoric and explores how rhetorical concepts and approaches function in literature and influence contemporary composition practices.

ENGL 4350. STUDIES IN POETICS AND POETRY AND POETRY OF THE 19TH TO 21ST CENTURIES
A study of topics in the poetics of the Anglo-American tradition, focusing on works written by (published) poets about poetry and poetics primarily from the 19th to the 21st centuries.

ENGL 4351. SENIOR CAPSTONE: 20TH AND 21ST CENTURY LITERATURE & WRITING
A study of twentieth- and twenty-first-century literature in English for the advanced writer. Emphasis placed on both creative writing and analytical expository writing. Prerequisite: ENGL 2370. This course should be taken during the student’s final year of academic study.

ENGL 4354. SCIENCE FICTION
A thematic study of representative works in the genre.

ENGL 4360. WOMEN’S LITERATURE
This course introduces students to literature by women, mainly in the U.S. It focuses on women authors’ relation to literary periods and conventions, as well as on the social context of their artistic productions.

ENGL 4361. ETHNIC AMERICAN LITERATURE
Topics focus on the social and cultural contexts of artistic productions by Native American, African American, or Chicana authors.

ENGL 4370. ORAL INTERPRETATION OF CHILDREN’S LITERATURE
A study, primarily through the medium of performance, of various types and forms of literature for children. Strongly oriented toward teaching literature in the elementary school classroom. (Credit may not be given for both this course and COMM 4323 or THEA 4323.)

ENGL 4380. CRITICAL APPROACHES TO LITERATURE AND CULTURE
A study of selected perspectives and critical approaches to literature and culture, including an examination of some of the theoretical assumptions upon which they are based, as well as their implications for the way we think about literature, human identity, and the power of language. Prerequisite: ENGL 2370.

ENGL 4390. TOPICS IN ENGLISH
May be repeated when topics vary.

ENGL 4396. DIRECTED INDIVIDUAL STUDY
See College description. Offered on application.

ENGL 4397. APPLIED EXPERIENCE IN TECHNICAL/PROFESSIONAL WRITING
Practical experience in technical and professional writing. May apply for three hours credit in the minor. Offered by application. See college description of applied experience for courses numbered 4398.

ENGL 4398. APPLIED EXPERIENCE
See College description. Offered on application.

ENVIRONMENTAL SCIENCE (ESCI)
Weekly lecture and laboratory hours associated with each course are designated by (lecture:lab) following the semester hours. The indicated laboratory hours are laboratory instructional time. In most cases additional laboratory time will be required to complete assigned work. All courses involving labs will require appropriate fees.

Prerequisites for Environmental Science courses may be waived only by permission of the instructor. Environmental Science is a highly interdisciplinary field; courses applicable to the Environmental Science major or minor and which are offered by other departments appear in the appropriate sections of the catalog.

ESCI 1401 (ENVR 1401) 4 sem. hrs. (3:2)
ENVIRONMENTAL SCIENCE I: INTRO TO ENVIRONMENTAL SCIENCE
Principles of the scientific method and critical thinking provide a foundation for subsequent consideration of environmental issues through a multidisciplinary approach. Laboratory exercises and local field experiences reinforce concepts introduced in the lectures. This course counts toward the natural science component of the University Core Curriculum. Fall.

ESCI 1402 (ENVR 1402) 4 sem. hrs. (3:2)
ENVIRONMENTAL SCIENCE II: SYSTEMS AND APPLICATIONS
Continues material introduced in ESCI 1401; this is not a prerequisite, but familiarity with basic environmental science is expected. Course takes a topical and case-study approach. Laboratory exercises and local field experiences reinforce concepts introduced in the lectures.