Engineering Technology, Room 240 Telephone 208 426-5640
http://coen.boisestate.edu/ece/home.asp Fax 208 426-2470

Chair and Professor: R. Jacob Baker, Associate Chair and Associate Professor: Barney Smith. Professor: Schrader. Associate Professors: Ahmed-Zaid, Browning, Campbell, Chiasson, Knowlton, Mitkova, Rafia. Assistant Professors: Han, Kuang, Loo, Smith. Research Assistant Professor: Nandikolla. Special Instructor: Hay.

Degrees Offered
• B.S. and Minor in Electrical Engineering (B.S.E.E.)
• M.S. in Electrical Engineering (See the BSU Graduate Catalog)
• M. Engr. in Electrical Engineering (See the BSU Graduate Catalog)
• M.S. in Computer Engineering (See the BSU Graduate Catalog)
• M. Engr. in Computer Engineering (See the BSU Graduate Catalog)
• Ph.D. in Electrical and Computer Engineering (See the BSU Graduate Catalog)

Program Statement
Today's electrical engineer must be able to find solutions to new complex technical problems. He/she must have strong people skills and be able to integrate technical concepts with those of management, public policy, safety, and environmental areas in a team environment. Boise State offers five major areas of concentration:
• semiconductor processing
• integrated circuit design
• communication systems
• computer engineering
• power and energy systems

The many laboratory courses in the program provide students with significant hands-on experience which is attractive to potential employers.

Educational Objectives
Graduates of the electrical engineering program will be:
1. prepared with broad fundamentals rooted in the mathematics, science, and engineering, as well as contemporary skills in one or more select areas of electrical engineering needed primarily by high-tech companies and industries;
2. able to readily apply their extensive laboratory and design experience to solve new and challenging engineering problems using modern instrumentation and software tools;
3. able to communicate effectively and to function both independently and in group environments;
4. able to adapt to changing technology and human needs and will be prepared for continued professional development, advanced training and specialization, and/or graduate education;
5. able to function as responsible decision makers following professional codes of ethics and standards and to understand the broad impact of their profession in the global/societal business and environmental context.

Engineering Design in Electrical Engineering
Design is central to the practice of engineering. The department requires each student to develop design skills and knowledge. The curriculum has been carefully formulated to emphasize: 1) design as a process in the freshman year; 2) solving open-ended problems during the sophomore year; 3) component and system design in the junior year; and 4) the capstone design project in the senior year.

Degree Requirements

Degree Requirements

<table>
<thead>
<tr>
<th>Course Number and Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 101-102 English Composition</td>
<td>6</td>
</tr>
<tr>
<td>Area I — see page 44 for list of approved courses</td>
<td></td>
</tr>
<tr>
<td>Area I core course in one field</td>
<td>3</td>
</tr>
<tr>
<td>Area I core course in a second field</td>
<td>3</td>
</tr>
<tr>
<td>Area II — see page 44 for list of approved courses</td>
<td></td>
</tr>
<tr>
<td>COMM 101 Fundamentals of Speech Communication</td>
<td>3</td>
</tr>
<tr>
<td>Area II core course in a second field</td>
<td>3</td>
</tr>
<tr>
<td>Area I-II Depth Elective</td>
<td></td>
</tr>
<tr>
<td>Area I core course in a third field AND an elective depth course** which is a second course in an Area II field that has been approved by the student’s advisor, not necessarily from the list of core courses OR Area II core course in a third field AND an elective depth course** which is a second course in an Area I field that has been approved by the student’s advisor, not necessarily from the list of core courses.</td>
<td>6</td>
</tr>
<tr>
<td>Area III</td>
<td></td>
</tr>
<tr>
<td>Area III requirements are automatically met by specific courses included in the major requirements below.</td>
<td></td>
</tr>
<tr>
<td>CHEM 111 General Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>COMPSCI 125, 225 Introduction to Computer Science I and II</td>
<td>8</td>
</tr>
<tr>
<td>ECE 210 Introduction to Electric Circuits</td>
<td>3</td>
</tr>
<tr>
<td>ECE 225, 225L Circuit Analysis and Design and Lab</td>
<td>4</td>
</tr>
<tr>
<td>ECE 230, 230L Digital Systems and Lab</td>
<td>4</td>
</tr>
<tr>
<td>ECE 280 Sophomore Outcome Assessment</td>
<td>0</td>
</tr>
<tr>
<td>ECE 322, 322L Microelectronic Circuits and Lab</td>
<td>4</td>
</tr>
<tr>
<td>ECE 323, 323L Microprocessors and Lab</td>
<td>4</td>
</tr>
<tr>
<td>ECE 332, 332L Microprocessors and Lab</td>
<td>4</td>
</tr>
<tr>
<td>ECE 350, 350L Signals and Systems and Lab</td>
<td>4</td>
</tr>
<tr>
<td>ECE 360 System Modeling and Control</td>
<td>3</td>
</tr>
<tr>
<td>ECE 390 Electromagnetic Theory</td>
<td>3</td>
</tr>
<tr>
<td>ECE 480, 482 Senior Design Project I, II</td>
<td>6</td>
</tr>
<tr>
<td>ENGL 202 Technical Communication</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 120 Introduction to Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MATH 270, 275 Multivariable and Vector Calculus</td>
<td>4</td>
</tr>
<tr>
<td>MATH 333 Differential Equations with Matrix Theory</td>
<td>4</td>
</tr>
<tr>
<td>MATH 360 Probability and Statistics I</td>
<td>3-4</td>
</tr>
<tr>
<td>PHYS 211, 211L-212, 212L Physics I &amp; II with Calculus and Lab</td>
<td>10</td>
</tr>
<tr>
<td>Electrical Engineering electives</td>
<td>9</td>
</tr>
<tr>
<td>Technical electives</td>
<td>6</td>
</tr>
<tr>
<td>Elective to total 128 hours</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>128</td>
</tr>
</tbody>
</table>

NOTE: "All university core courses and technical and design electives must be approved by the student's advisor. "Courses that instill cultural values are acceptable while routine exercises of personal craft are not.
Course Offerings

See page 65 for a definition of the course-numbering system.

EGR — ENGINEERING SCIENCE
See page 136 for the listing of EGR courses.

ECE — ELECTRICAL AND COMPUTER ENGINEERING

Lower Division


ECE 225L CIRCUIT ANALYSIS AND DESIGN LAB (0-3-1)(F). Lab work to accompany ECE 225 Circuit Analysis and Design. COREQ: ECE 225.

ECE 230 DIGITAL SYSTEMS (3-0-3)(F). Number systems, Boolean algebra, logic gates, Karnaugh mapping, combinational circuits, flip-flops, registers, counters, sequential state machines. Construction of small design projects. PREREQ.: COMPSCI 117 or COMPSCI 125.


ECE 288 SOPHOMORE OUTCOME ASSESSMENT (0-0-0)(F). Competency-based examination to assess student ability in mathematics, basic sciences and engineering. Required for admission to upper-division ECE curriculum (PAss/Fail). PREREQ: ECE 230, ECE 210, ENGR 245, MATH 333. COMPSCI: COMPSCI 225. ECE 225, MATH 275, PHYS 212.

Upper Division

ECE 310 (MSE 310) ELECTRICAL PROPERTIES OF MATERIALS (3-0-3)(F). Physical principles underlying the electrical properties of metals, insulators and semiconductors. The effects of energy band structure, thermal properties and impurities on electrical conductance. Concepts covered are applied to electrical devices including nanodevices, MOSFETS and optoelectronic devices. May be taken for ECE or MSE credit, but not both. PREREQ: ENGR 245 and MATH 333.

ECE 322 MICROELECTRONIC CIRCUITS (3-0-3)(F). Circuit design and analysis using diodes, bipolar junction transistors, and MOSFETS. Introduction to design with op-amps. Circuit simulation with SPICE. PREREQ: ECE 225 and ECE 288.

ECE 322L MICROELECTRONIC CIRCUITS LAB (0-3-1)(F). Hands-on design, construction, and test of electronic circuits using signal generators, power supplies, and oscilloscopes. COREQ: ECE 322.


ECE 323L DEVICE CHARACTERIZATION LAB (0-3-1)(S). Measurement of PN junction, BJTs, and MOSFET IV and C-characteristics by on-wafer probing. SPICE model parameter extraction. COREQ: ECE 323.

ECE 332 MICROPROCESSORS (3-0-3)(F/S). Microprocessor architecture, software development tools, and hardware interfacing. Emphasis is placed on 16 and 32 bit microprocessor systems. Machine and assembly language programming, instruction set, addressing modes, programming techniques, memory systems, I/O interfacing, and interrupt handling are among the topics studied with practical applications in data acquisition, control, and interfacing. PREREQ: ECE 230.

ECE 332L MICROPROCESSORS LAB (0-3-1)(F/S). Lab work on microprocessors using a Macro assembler and a hardware experimentation kit. COREQ: ECE 332.


ECE 350L SIGNALS AND SYSTEMS LAB (0-3-1)(F/S). Lab work on signals and systems. COREQ: ECE 350.


ECE 376 INDUSTRIAL POWER DISTRIBUTION (3-0-3)(S). Codes and standards, transmission and single-phase system planning and design, voltage control, power quality, equipment protection, grounding design, power switching and motor control, lighting design, substation design, PLC system architecture and design, and programming, equipment specification, construction drawings and specifications. PREREQ: ECE 225 or PERM/INST.

ECE 390 (PHYS 381) ELECTROMAGNETIC THEORY (3-0-3)(F). Electrostatics, magnetic fields, potentials, Gauss’ law, solutions of Laplace’s equation, electrostatics of conductors and dielectric materials, vector potentials, Maxwell’s equations, and electromagnetic radiation. This course may be taken for either PHYS or ECE credit, but not both. PREREQ: MATH 275, MATH 333 and PHYS 212.

ECE 410 INTEGRATED CIRCUIT PHYSICAL DESIGN (3-0-3)(F). CMOS IC layout, modeling, parasitic capacitance extraction, SPICE simulation. Design of static and dynamic logic gates, counters, registers, memories. Students will produce a verified layout file that can be used to build a set of photomasks for fabrication in either a foundry or in ECE 440. PREREQ: ECE 322.

ECE 410L MOSIS CHIP EVALUATION (0-3-1)(F). Laboratory to evaluate the CMOS integrated circuit chips designed in ECE 410 and fabricated through MOSIS (metal-oxide-semiconductor implementation system). PREREQ: ECE 410.


ECE 413 RF IC DESIGN (3-0-3)(F). Design and characterization of RF-CMOS integrated circuits, including RF transceivers, oscillators, designs approaches for handheld wireless systems, ultra-low-power circuit design techniques, on-wafer microwave measurement techniques. parameter device evaluation methods, low noise design and measurement, analysis of distortion in amplifiers, power amplifiers with application to wireless transmitter design, transmission lines and distributed circuit elements. The laboratory component will teach wafer-level microwave measurement techniques. PREREQ: ECE 400, ECE 410.

ECE 418 MEMORY CIRCUIT DESIGN (3-0-3)(F). Alternare years. Transistor level design of memory circuits. Memory technologies including DRAM, Flash, MRAM. Glass-based, and SRAM will be discussed. Practical introduction to the design of memory circuits. PREREQ: ECE 410.

ECE 420 ADVANCED DEVICE DESIGN AND SIMULATION (3-0-3)(F). MOSFET device physics, scaling rules, analytical short channel models, hot-electron effects/modeling, LDD design, gate-oxide breakdown and reliability. TID, GIDL, channel mobility, electromigration, BSIM device modeling, 2D TCAD-device simulation. PREREQ: ECE 322.

ECE 420L ADVANCED DEVICE CHARACTERIZATION LAB (0-3-1)(F). Advanced measurement and parameter extraction techniques for MOSFETs. High frequency CV, Quasistatic CV, Charge-Pumping measurements. COREQ: ECE 420.

ECE 421 ADVANCED SEMICONDUCTOR DEVICES (3-0-3)(F). Study of advanced semiconductor devices, particularly photonic, microwave, power, and high-temperature radiation resistant devices, including physics and applications. TCAD simulation and modeling of these devices will be included. PREREQ: ECE 420.

ECE 422 MICROWAVE SEMICONDUCTOR DEVICES (3-0-3)(F). Covers the various aspects of design, fabrication, and characterization of ultra-low-power, RF-CMOS devices, on-wafer microwave measurement techniques and calibration techniques, short-channel CMOS device physics, parasitic CMOS device elements, advanced small-signal and large and SOI RF-CMOS device models, and 2D parasitic device evaluation methods. PREREQ: ECE 420.

ECE 430 DIGITAL HARDWARE DESIGN (3-0-3)(F). Advanced topics in digital system design emphasizing the specification and design of complex digital hardware systems. Applications include design of synchronous state machines, asynchronous digital systems, and simple digital control circuits using hardware descriptive languages for field programmable gate arrays and complex programmable logic. PREREQ: ECE 230, COMPSCI 117 or COMPSCI 125.

ECE 430L DIGITAL HARDWARE DESIGN LAB (0-3-1)(F). Lab work using UNIX-based CAD tools for hardware design of digital systems employing FPGAs and CPLDs. COREQ: ECE 430.

ECE 432 (COMPSCI 441) COMPUTER ARCHITECTURE (3-0-3)(S). Structure of computer systems using processors, memories, input/output (I/O) devices as building blocks. Computer system instruction set design and implementation, including memory hierarchies, microprogramming, pipelining and multiprocessors. Issues and trade-offs involved in the design of computer system architectures with respect to the design of instruction sets. Applications of Hardware Description Languages (HDL) in the design of computer systems. May be taken for either COMPSCI or ECE credit, but not both. PREREQ: COMPSCI 117 or COMPSCI 125, and ECE 322 or PERM/INST.

ECE 433 EMBEDDED AND PORTABLE COMPUTING SYSTEMS (3-0-3)(F). Embedded control of commercial and custom available microcontrollers and their use in embedded system communications and control applications. Power consumption, software development, interprocessor communication, and interfacing with sensors, actuators, and input/output devices. Use of microcontroller cores implemented in programmable logic devices as an alternative to hardwired microcontrollers. An embedded system project is designed and built. PREREQ: ECE 332.

ECE 436 DIGITAL SYSTEMS RAPID PROTOTYPING (3-0-3)(S). Hardware description languages and hardware programming languages as a practical means to simulate/implement hybrid sequential and combinational systems. Actual design and implementation of sizeable digital design problems using the most up-to-date industry Computer Aided Design tools and Field Programmable Gate Arrays. PREREQ: ECE 442 or PERM/INST.

ECE 440 INTRO TO INTEGRATED CIRCUIT AND MEMS PROCESSING (3-0-3)(F). Fundamentals of integrated circuit and micro-electromechanical systems (MEMS) fabrication technology; semiconductor substrates; theory of unit processes such as diffusion, oxidation, ion implantation, rapid thermal processing, photolithography, wet etching and cleaning, dry etching, thin film deposition, chemical mechanical polishing, process integration, metrology, statistical process control; TCAD. PREREQ: ECE 323 or PERM/INST COREQ: ECE 440L.

ECE 440L INTRO TO INTEGRATED CIRCUIT AND MEMS PROCESSING (3-0-3)(F). Semiconductors, sumo quantum processes, heavy ion laser, stainless steel will fabricate and test sample structures in lab. application of TCAD to practical problems. COREQ: ECE 440.

ECE 441 ADVANCED SILICON TECHNOLOGY (3-0-3)(S). Advanced models for unit processes such as diffusion, oxidation, ion implantation, thin film deposition, etching, rapid thermal processing, chemical mechanical polishing, and lithography. CMOS, bipolar, and micro-electromechanical systems (MEMS) process integration. Process and device modeling using TCAD. PREREQ: ECE 440.


ECE 442L PHOTOLITHOGRAPHY LAB (0-3-1)(F). Cleanroom lab experience accompanying ECE 442, utilizing a projection-printing water stepper, photosist wafer track, SEM, and optical metrology equipment. Use of TCAD lithography simulation software. PREREQ: ECE 342. COREQ: ECE 442.

ECE 451 COMMUNICATION SYSTEMS (3-0-3)(S). Signals, noise, propagation and protocol in analog and digital communication systems. Bandwidth, Fourier transforms, signal to noise ratio and receiver noise figures. Introduction to modern wireless communication systems such as cellular, wireless data and satellite data systems. PREREQ: ECE 350, and MATH 360 or MATH 361.


ECE 452 WIRELESS COMMUNICATIONS (3-0-3)(F). Modern cellular communication systems, including propagation, handoff, noise, and interference studies. CDMA and other spread spectrum systems. PREREQ: ECE 451.


ECE 457 DIGITAL IMAGE PROCESSING (3-0-3)(F). Pictures and their computer representation. Image restoration, enhancement, and prediction methods. Digital enhancement techniques, histogram equalization, restoration, filtering and edge detection. Color models and transformations. Wavelets and morphological algorithms. PREREQ: ECE 350 and COMPSCI 125, or PERM/INST.

ECE 461 (ME 461) CONTROL SYSTEMS (3-0-3)(S). Time and frequency domain analysis and design of feedback systems using classical and state space methods. Observability, controllability, pole placement, observers, and discrete time. Multivariable and optimal methods are introduced. May be taken for ECE or ME credit, but not both. PREREQ: ECE 360 or ME 360.

ECE 464 ROBOTICS AND AUTOMATED SYSTEMS (3-0-3)(F). An introduction to robotics with emphasis on automated systems applications. Topics include: basic components of robotic systems; selection of coordinate frames; homogeneous transformations; solutions to kinematic equations; velocity and force/torque manipulator dynamics; digital simulation of manipulator motion; motion planning; actuators of robots; sensors of robot; obstacle avoidance; and control design. PREREQ: ECE 360.


ECE 470L ELECTRIC MACHINES LAB (0-3-1)(F). Lab work on electric machines. COREQ: ECE 470.


ECE 471L ELECTRIC MACHINES AND DRIVES LAB (0-3-1)(S). Lab work on electric machines and drives. COREQ: ECE 470.

ECE 472 POWER ELECTRONICS (3-0-3)(F). Power electronic switches, diode and controlled rectifiers, AC/DC phase control, DC/DC converters, inverters, introduction to electric drives and power quality fundamentals. PREREQ: ECE 225.

ECE 472L POWER ELECTRONICS LAB (0-3-1)(F). Lab work on power electronic circuits and devices. COREQ: ECE 472.

ECE 473 POWER SYSTEM ANALYSIS I (3-0-3)(F). Three-phase AC systems, generators, transformers, transmission lines, one-line diagrams, per-unit system, network calculations, load flow studies, power system operation. PREREQ: ECE 225, ECE 390.

ECE 474 POWER SYSTEM ANALYSIS II (3-0-3)(S). Fault analysis, symmetrical components, power system transients, protection and relaying, transient stability, power system operation and control, power grid economics, power quality, and power system reliability. PREREQ: ECE 473.

ECE 480-482 SENIOR DESIGN PROJECT I, II (2-3-3)(F). Capstone design experiences integrating previous design work with design theory and methodology. Applied through group project to integrate specifications based upon customer and engineering requirements, computer modeling, simulation, and reliability analysis. Includes a series of project reports, formal presentations, and a written report. Development of skills used in the engineering profession: teamwork, effective meetings, safety, ethics, project management, and time management. PREREQ: ECE 322, ECE 332, and ECE 350. PREREQ for ECE 482. ECE 480.

Engineering Science
Engineering and Technology Building, Room 101
Telephone 208 426-5983
http://coe.n.boisestate.edu/ 
Fax 208 426-2470

Coordinator: Dr. Janet Hampikian

Engineering Science courses are included as major elements in the program curriculum of Civil, Electrical, Materials Science and Engineering, Mechanical Engineering and Construction Management. These courses are administered and taught by Departments in the College of Engineering.

Course Offerings
See page 65 for a definition of the course-numbering system.

ENGR — ENGINEERING SCIENCE

Lower Division

ENGR 100 ENERGY FOR SOCIETY (3-2-4)(Area III)(F/S). A general interest course having no prerequisite. A basic understanding of energy and how it has been put to use is developed to promote a better understanding of our present technological society with its energy environmental, social, and political problems. Alternative as well as conventional energy sources are considered.

ENGR 102 THE ETHICAL DIMENSIONS OF TECHNOLOGY (3-0-3)(F/S) (Area I)(Diversity). The ethical obligations of those who exercise technology on behalf of the larger society. Discusses the moral obligations of engineer’s in their personal lives and professional practice. By focusing on the ethical dilemmas encountered by prominent engineers, this course introduces a discussion of virtue, duty, utility, discourse, and care ethics.

ENGR 110 ENGINEERING MATHEMATICS WITH PRE-CALCULUS (1-4-1)(F). An engineering course to be taken in conjunction with pre-calculus. Introduction to the engineering profession, fundamentals of the engineering process, engineering applications of algebra and trigonometry as well as time management study skills. COREQ: MATH 147.

ENGR 120 INTRODUCTION TO ENGINEERING (1-4-1)(F). Critical thinking design-oriented engineering experiences that introduce the professions of civil, electrical/computer, mechanical and materials sciences and engineering. Professional skill development including teamwork, computer based design, oral and written communication, advisement. PREREQ: MATH 147 or MATH 145 and MATH 144.

ENGR 205 MECHANICS/STATICS (3-0-3)(F). Covers basic statics including equilibrium, analysis of trusses, frames and machines, centroids, static friction, moments of inertia. PREREQ: PHYS 111 and MATH 160 or MATH 170.

ENGR 210 ENGINEERING STATICS (3-0-3)(F). Force and moment equilibrium applied to engineering systems including structures and machines. Two and three dimensional applications of scalars and vectors, free body diagrams, and methods and procedures of engineering analysis. PREREQ: MATH 173, PHYS 211 and ENGR 120 or CE 120.

ENGR 220 ENGINEERING DYNAMICS (3-0-3)(F). Kinematics and kinetics of particles and rigid bodies using concepts of force and acceleration, working and energy, and impulse and momentum. PREREQ: ENGR 210.

ENGR 240 ELECTRICAL AND ELECTRONIC CIRCUITS (3-0-3)(F/S). A concise overview of the basic concepts, methods, and tools employed in the broad field of electrical and electronic engineering. Provides a foundation for use through out a career in engineering or science to understand, analyze, and improve systems that incorporate electronic circuits or electrical machinery/equipment. Basic circuit theory, analog & digital electronic components/ circuits, communication circuits, power distribution circuits, and AC/DC machines. PREREQ: ENGR 120 or CE 120, and PHYS 212. COREQ: MATH 233.

ENGR 245 INTRODUCTION TO MATERIALS SCIENCE AND ENGINEERING (3-0-3)(S). Application of basic principles of physics and chemistry to the engineering properties of materials. Development of a fundamental understanding of structure, property, processing, and performance relationships in all classes of materials including metals, ceramics, polymers and electronic materials. PREREQ: CHEM 111 and MATH 170.

ENGR 245L MATERIALS SCIENCE AND ENGINEERING LABORATORY (3-0-1)(F/S). Practical experience in testing and processing of engineering materials, data acquisition, data analysis, and technical communication. COREQ: ENGR 245.

ENGR 320 THERMODYNAMICS I (3-1-3)(F/S). Thermodynamic properties of fluids, 1-D heat transfer, compression and expansion work, system and process analysis applying the first and second laws of thermodynamics, basic heat engine and heat pump theory, and cycles. PREREQ: CHEM 113, MATH 175, and PHYS 211.

ENGR 330 FLUID MECHANICS (3-0-3)(F/S). Physical properties of fluids, fluid mechanics, measurements, viscous flow, turbulent flow, momentum, lift, drag, boundary layer effects, pipe flow, and open channel flow. PREREQ: ENGR 230, MATH 275, MATH 333.

ENGR 331 FLUID MECHANICS LAB (0-3-1)(F/S). Fluid mechanics experiments, measurements, data acquisition, and data analysis. Viscosity, fluid statistics, hydraulics, computational fluid dynamics, pipe flow, turbulence, drag, and lift. COREQ: ENGR 330.


ENGR 360 ENGINEERING ECONOMY (3-0-3)(F/S). Economic analysis and comparison of engineering alternatives by annual cost, present worth, capitalized cost, and rate-of-return methods; income tax considerations. PREREQ: Junior standing.

ENGR 385 SCIENCE METHODS THROUGH ENGINEERING (2-4-3)(F/S). Examines elementary science curricula, philosophy, and methodologies through a design-oriented engineering experience. A variety of instructional strategies and materials are presented and evaluated in accordance with developmental theory. Emphasis is placed on inquiry in the science curricula. These areas are integrated across the curriculum, emphasizing process, critical thinking, technology, and assessment. PREREQ: MATH 257.

ENGR 400 RESEARCH METHODS (1-0-1)(F/S). Defining a thesis or other research project, library and internet searching techniques, completing a literature review, preparing a research or project plan, research methods, preparing the thesis proposal, preparing the final thesis or research project document, and preparing a successful oral presentation. PREREQ: PRISM/INST.

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Chair and Associate Professor: Michelle Payne. Associate Chair and Associate Professor: Devan Cook. Director of M.A. in English and Assistant Professor: Matt Hansen. Director of Technical Communication and Professor: Mike Markel. Director of First-Year Writing Program and Assistant Professor: Heidi Estrem. Associate Director of First-Year Writing Program and Assistant Professor: Tom Peele. Director of Creative Writing and Associate Professor: Mitch Wieland. Director of Writing Center and Assistant Professor: Mike Mattison. Professors: Dayley, Lojek, Trusky, Widmayer, Wilhelm, Zaerr. Associate Professors: Battalo, Corless-Smith, Munger, O’Connor, Olsen-Smith, Perry, Robbins, Ryder, R. Sanderson, Uehling, Wieland. Assistant Professors: Campbell, Estrem, Ewett, Hansen, Hillard, Hindrichs, McGuire, Newman, Peele, Ramirez-Dhoore, Shuck, Udall, Willerton.

Degrees Offered
• B.A. in English, Linguistics Emphasis
• B.A. and Minor in English, Literature Emphasis
• B.A. in English Teaching
• B.A. in English, Technical Communication Emphasis
• B.A. in English, Writing Emphasis
• M.A. in English (See the BSU Graduate Catalog.)
• M.A. in Technical Communication (See the BSU Graduate Catalog.)
• M.F.A. in Creative Writing (See the BSU Graduate Catalog.)
• Certificate and Graduate Certificate in Technical Communication

Department Statement
The major in English provides excellent preparation for many professional degrees and for a variety of careers demanding strong critical thinking and communication skills. The major also prepares students for traditional English graduate degrees in literature, rhetoric and composition, creative writing, linguistics, technical communication, and English teacher education.

To serve students’ personal and professional goals, the department has designed several options that prepare students for lifelong learning: for graduate work in literature, language, and writing, as well as in the professions and business; and for careers in government, business, and industry. The Linguistics Emphasis provides the opportunity for close study of how language works and of the connections between linguistics and such related fields as anthropology, sociolinguistics, and psychology; the linguistics emphasis also leads to graduate study and careers in linguistics and teaching English as a second language. The Literature Emphasis allows students to explore a wide range of authors, genres, and periods in English and American literature, as well as English-language literature produced in post-colonial and ethnic minority cultures. The English Teaching Emphasis fulfills Idaho certification requirements and prepares students to teach in school districts around the country. The Writing Emphasis, with components in poetry, fiction, non-fiction prose, and courses in book arts, gives students an opportunity to write, design, edit, and publish their own work; it prepares students for work in the fiction, nonfiction, and poetry markets, and for work in the many professions that require strong writing skills. In the Technical Communication Emphasis students learn to produce a wide variety of print and online documents for users in the computer industry, in the health sciences, and in many other fields.