

ENGINEERING (ENGR)

Any experimental courses offered by ENGR can be found at:

registrar.iastate.edu/faculty-staff/courses/explisting/ (<http://www.registrar.iastate.edu/faculty-staff/courses/explisting/>)

Courses primarily for undergraduates:

ENGR 101: Engineering Orientation

Cr. R. F.S.

Introduction to the College of Engineering and the engineering profession. Information concerning university and college policies, procedures, and resources. Undeclared sections: Considerations in choosing an engineering curriculum. Opportunities to interact with departments. Declared sections: Introduction to major-specific topics. Offered on a satisfactory-fail basis only.

ENGR 104: LEAD Program Orientation

(1-0) Cr. 1. F.

Orientation for LEAD Learning/Living Community participants. Introduction to college and university resources, tools and techniques to promote academic, professional and social/cultural development and success. Focus on building support networks with peers, faculty, and staff. Introduction to core engineering competencies including but not limited to initiative, communication, teamwork, and cultural adaptability. Offered on a satisfactory-fail basis only.

ENGR 105: LEAD Program Seminar

(1-0) Cr. 1. S.

Seminar for LEAD Learning/Living Community participants. Focus on professional development and exposure to various engineering disciplines through hands-on lab experiences, industry visits and networking opportunities with alumni, faculty, and staff. Development of core competencies: engineering/technical knowledge, communication and teamwork. Offered on a satisfactory-fail basis only.

ENGR 131: Learning Community Seminar

Cr. R. F.

Peer-mentored review of course topics in engineering undeclared learning communities. Offered on a satisfactory-fail basis only.

ENGR 150: Foundations of Leadership Development and Learning

(1-0) Cr. 1. F.S.

Prereq: ELP students only

Leadership development with focus on global context and awareness of events shaping the context. Exposure to theory of leadership with examples. Necessary characteristics of a leader, and strategies for leadership skills development. Exposure to non-traditional career paths for engineers. Outline of personalized leadership development. Offered on a satisfactory-fail basis only.

ENGR 160: Engineering Problems with Computer Applications Laboratory (2-2) Cr. 3. F.S.SS.

Prereq: MATH 143 or satisfactory scores on mathematics placement examinations

Solving engineering problems and presenting solutions through technical reports. Significant figures. Use of SI units. Graphing and curve-fitting. Flowcharting. Introduction to mechanics, statistics and engineering economics. Use of spreadsheet programs to solve and present engineering problems. Solution of engineering problems using computer programming languages. (The honors section includes application of programming to mobile robotics).

ENGR 250: Leadership in Engineering Teams

(1-0) Cr. 1. F.S.

Building and sustaining decision-making engineering teams. Students will explore the interrelated processes of discerning purpose, thinking systemically, developing reflective judgment, and exercising leadership by mobilizing and setting the direction for adaptive change within a team. Industry based examples and information from engineering and natural resource sciences will be infused into the course.

ENGR 260: Engineering: From Thought to Thing

(Cross-listed with IND D). (3-0) Cr. 3.

What is making, building, constructing, engineering and technology and their roles in society? Investigation of making techniques, engineering methods and technological advancements through case studies of everyday objects. Explore questions about the impact of materials choices and technology in society. Application of construction methods to industrial design.

ENGR 265: Survey of the Impacts of Engineering Activity

(3-0) Cr. 3. F.S.

Survey of the economic, environmental, societal, and political benefits and problems resulting from engineering activity. Effects of engineering projects on human health, social structures, and the environment. Examination of improvements in economic opportunities and quality of life resulting from engineering activity. Case studies of the effects of engineering activity.

ENGR 320: International Experience Report

Cr. 3. F.S.

Prereq: Satisfactory completion of international work experience of at least ten weeks or nine credits of approved course work taken abroad. Permission of student's department prior to departure

Critique of work/study abroad experience as it relates to professional development. Taken the semester after completion of work abroad or study abroad. Written report and presentation. Offered on a satisfactory-fail basis only.

Meets International Perspectives Requirement.

ENGR 327: Voices of Public Policy

(3-0) Cr. 3. F.

Prereq: Sophomore classification in engineering

Role and impact of legislative process, partisan politics, government, lobbyists, the media, expert testimony and grassroots activism on public policy. Critical analysis of context; of claims, assumptions, premises, and evidence of both sides; represented and disenfranchised populations; the ethical issues to develop personal position and courses of action to impact public policy process.

ENGR 340: Introduction to Wind Energy: System Design & Delivery

(3-0) Cr. 3. F.

Prereq: MATH 166, PHYS 222

Introduction to wind energy. Economic analysis related to wind energy. Electrical power generation, transmission, and grid operations. Tower, blade and nacelle materials and manufacturing. Tower design. Construction, transportation, supply chain and life cycle analysis for wind turbine components.

ENGR 350: Dean's Leadership Seminar

(1-0) Cr. 1. F.S.

Prereq: Selection based on demonstrated commitment to leadership development; for sophomore status or above.

Understanding the complexities of leadership in building an organization, decision-making styles, communication, managing change, building trust, shared responsibility leadership, creating legacy, prioritizing, effective use of authority, conflict, ethics, integrity, transparency, accountability. Offered on a satisfactory-fail basis only. May not apply toward a degree in Engineering

ENGR 430: Entrepreneurial Product Engineering

(Cross-listed with I E). Cr. 3. F.Alt. S., offered irregularly.

Prereq: Junior Classification

Process of innovative product development in both entrepreneurial and intra-preneurial settings. Define, prototype and validate a product concept based on competitive bench-marking, market positioning and customer requirement evaluation in a target market into a product design that is consistent with defined business goals and strategies. Combination of lecture, discussion, problem solving and case study review.

ENGR 466: Multidisciplinary Engineering Design

(Cross-listed with A B E, AER E, B M E, CPR E, E E, I E, M E, MAT E). (1-4) Cr. 3. Repeatable. F.S.

Prereq: Student must be within two semesters of graduation; permission of instructor.

Application of team design concepts to projects of a multidisciplinary nature. Concurrent treatment of design, manufacturing, and life cycle considerations. Application of design tools such as CAD, CAM, and FEM. Design methodologies, project scheduling, cost estimating, quality control, manufacturing processes. Development of a prototype and appropriate documentation in the form of written reports, oral presentations and computer models and engineering drawings.

ENGR 467: Multidisciplinary Engineering Design II

(Cross-listed with AER E, I E, M E, MAT E). (1-4) Cr. 3. Repeatable, maximum of 2 times. Alt. F., offered irregularly. Alt. S., offered irregularly.

Prereq: Student must be within two semesters of graduation or receive permission of instructor.

Build and test of a conceptual design. Detail design, manufacturability, test criteria and procedures. Application of design tools such as CAD and CAM and manufacturing techniques such as rapid prototyping. Development and testing of a full-scale prototype with appropriate documentation in the form of design journals, written reports, oral presentations and computer models and engineering drawings.

ENGR 490E: Entrepreneurship

Cr. 1-3. Repeatable, maximum of 3 credits.

Prereq: Junior or senior classification in engineering, college approval

ENGR 490L: Independent Study

Cr. 1-3. Repeatable, maximum of 3 credits. F.S.SS.

Leadership.