

# ENGINEERING (ENGR)

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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.S.

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; credit or enrollment in MATH 165*

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 160H: Engineering Problems with Computer Applications Laboratory

(2-2) Cr. 3. F.S.SS.

*Prereq: MATH 143 or satisfactory scores on mathematics placement examinations; credit or enrollment in MATH 165*

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 260: Engineering: Getting from Thought to Thing

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

What is engineering, technology and their roles in society? Investigation of engineering methods through case studies of everyday objects. Explore questions about the impact of technology in society. Apply engineering methods to design and failure analysis.

## 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 270: Survey of How Things Work

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

Removing mysteries surrounding science and technology. Identify key concepts from applied science and technology to obtain better understanding on how things work. Review and explain the principles behind the technologies which define our modern way of life. A survey of broad range of technology could include: cell phones, GPS, radio, television, computers, ultrasound, microwave ovens, automobile, bioengineering and other industrial and consumer technologies. Common day technology examples illustrating scientific knowledge and applications.

## 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. Sophomore or higher.*

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 396: Summer Internship**

Cr. R. Repeatable. SS.

*Prereq: Permission of adviser and Engineering Career Services*

Professional or interdisciplinary work period in engineering or career-related field of a minimum of 10 weeks during the summer. Offered on a satisfactory-fail basis only.

**ENGR 397: Professional Internship**

Cr. R. F.S.SS.

*Prereq: Permission of adviser and Engineering Career Services*

Professional or interdisciplinary work period in engineering or career-related field. Enrollment limited to one semester and/or one summer per academic year. Offered on a satisfactory-fail basis only.

**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 and 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, computer models and engineering drawings.

**ENGR 467: Multidisciplinary Engineering Design II**

(Cross-listed with AER E, CPR E, E 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.