Engineering (ENGIN)

Courses

Expand all course descriptions [+]Collapse all course descriptions [-]

ENGIN 1 Engineering Your Life: Skills for Leadership, Discovery and Service 1 Unit

Terms offered: Spring 2020
This course provides the framework for engineering an empowered life through leadership, discovery and service. The class focuses on development of self, emotional intelligence, strategic thinking, problem solving, teamwork, diversity, and service learning. Skills include developing of self-awareness; understanding our unique strengths; debunking the imposter syndrome; creating plans of action and setting goals; giving and receiving assessments; interpreting body language; managing time and life-balance; and creating mission statements. Teamwork skills include methods for inspiring others; variations in leadership styles and team dynamics; rhythm of action for projects and teams; difficult conversations and conflict resolution; mechanisms.
Engineering Your Life: Skills for Leadership, Discovery and Service: Read More [+]

Objectives Outcomes

Course Objectives: This course offers the requisite framework for engineering an empowered life. The course provides students with requisite skills for authentic leadership, self-discovery and societal service. These attributes are in alignment with the mission of the College of Engineering and the Berkeley campus.

Student Learning Outcomes: Students will learn how to assess personal strengths, implement plans of action and develop mission statements. Students will learn how to optimize their knowledge with assessment of learning styles along with key communication tools necessary for conflict resolution and inspiration of others (teamwork). Through a series of active exercises and self-reflection activities the students will learn requisite skills for self-discovery and the creation of a personal leadership plan.

Rules & Requirements

Prerequisites: Designed for engineering freshmen, the class is open to all students in the College of Engineering or by permission of instructor

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of lecture per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Alternative to final exam.

Instructor: Pruitt

Engineering Your Life: Skills for Leadership, Discovery and Service: Read Less [-]

ENGIN 7 Introduction to Computer Programming for Scientists and Engineers 4 Units

Terms offered: Summer 2020 10 Week Session, Spring 2020, Fall 2019
Elements of procedural and object-oriented programming. Induction, iteration, and recursion. Real functions and floating-point computations for engineering analysis. Introduction to data structures. Representative examples are drawn from mathematics, science, and engineering. The course uses the MATLAB programming language. Sponsoring departments: Civil and Environmental Engineering and Mechanical Engineering.
Introduction to Computer Programming for Scientists and Engineers: Read More [+]

Rules & Requirements

Prerequisites: MATH 1B (http://guide.berkeley.edu/search/?P=MATH%201B) (may be taken concurrently)

Credit Restrictions: Students will receive no credit for Engineering 7 after completing Engineering W7. A deficient grade in Engineering W7 may be repeated by taking Engineering 7.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture, 1 hour of discussion, and 4 hours of laboratory per week

Summer: 10 weeks - 3 hours of lecture, 1.5 hours of discussion, and 6 hours of laboratory per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: 77

Introduction to Computer Programming for Scientists and Engineers: Read Less [-]

ENGIN W7 Introduction to Computer Programming for Scientists and Engineers 4 Units

Terms offered: Summer 2016 10 Week Session, Summer 2015 10 Week Session, Summer 2014 10 Week Session
Elements of procedural and object-oriented programming. Induction, iteration, and recursion. Real functions and floating-point computations for engineering analysis. Introduction to data structures. Representative examples are drawn from mathematics, science, and engineering. The course uses the MATLAB programming language.
Introduction to Computer Programming for Scientists and Engineers: Read More [+]

Rules & Requirements

Prerequisites: MATH 1B (http://guide.berkeley.edu/search/?P=MATH%201B) (may be taken concurrently)

Credit Restrictions: Students will receive no credit for Engineering W7 after completing Engineering 7 or 77. A deficient grade in Engineering 7 or 77 may be removed by taking Engineering W7.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of web-based lecture, 4 hours of laboratory, and 1 hour of web-based discussion per week

Summer: 10 weeks - 6 hours of web-based lecture, 0 hours of laboratory, and 7.5 hours of web-based discussion per week

Online: This is an online course.

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Papadopoulos

Introduction to Computer Programming for Scientists and Engineers: Read Less [-]

ENGIN 11 A Hands-on Introduction to Radiation Detection: Getting to know our Radioactive World 3 Units

Terms offered: Fall 2019, Spring 2007, Fall 2006
Introduction to basic concepts in radiation detection and radioactivity, electrical circuits, and data analytics. Lectures provide the theoretical foundation of the work being performed in the accompanying laboratory. The course will contain three sections: introduction to how radiation interacts with matter and radiation detection technologies; development of the tools (mathematical and computational) needed for analyzing various types of radiation and environmental data; and building of a basic radiation sensor system.
A Hands-on Introduction to Radiation Detection: Getting to know our Radioactive World: Read More [+]

Objectives Outcomes

Course Objectives: The course is suitable for Nuclear Engineering students, other Engineering majors, and any students interested in gaining a general understanding of radiation detection.
The focus of this course will be on the application of the nuclear science, radiation detection, and data analysis concepts covered to the building of a multi-sensor radiation detection system, following a template for the required data acquisition software and circuit integration.
Fieldwork related to a chosen research topic will be carried out in small groups, with group oral presentations and final reports. Students will be introduced to research opportunities on campus and at nearby lab facilities through tours of lab spaces throughout the department and field trips to LBNL and LLNL.

Students will be introduced to core concepts in nuclear science, statistical analysis, and computation, while being given practical experience applying those concepts to radiation detection and data analysis.
The objective of this course is to provide Freshman and Sophomore students with an introduction to the fundamentals of nuclear radiation and radiation detection through a hands-on approach.

Student Learning Outcomes: Be able to outline and carry out a research project, prepare written and oral presentations of that work, and demonstrate how the sensors they built work.
By the end of this course, students should be able to:
Identify types of radioactivity, radiation detection methods and sources of environmental radiation,

Create simple circuit designs making use of standard circuitry components, demonstrate basic soldering skills, and demonstrate a familiarity with printed circuit board design tools,
Make use of software tools including the Python programming language, version control with git, and shell environments,
Perform statistical analysis of large data sets and quantify statistical and systematic uncertainties in experimental data,

Rules & Requirements

Credit Restrictions: Students will receive no credit for ENGIN 11 (http://guide.berkeley.edu/search/?P=ENGIN%2011) after completing ENGIN 11 (http://guide.berkeley.edu/search/?P=ENGIN%2011). A deficient grade in ENGIN 11 (http://guide.berkeley.edu/search/?P=ENGIN%2011) may be removed by taking ENGIN 11 (http://guide.berkeley.edu/search/?P=ENGIN%2011).

Hours & Format

Fall and/or spring: 15 weeks - 1.5 hours of lecture and 2 hours of laboratory per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

ENGIN 24 Freshman Seminar 1 Unit

Terms offered: Spring 2012, Fall 2011, Fall 2008
The Berkeley Seminar Program is designed to provide students with the opportunity to explore an intellectual topic with a faculty member in a small seminar setting. Berkeley Seminars are offered in all college departments, and topics vary from department to department and semester to semester.
Freshman Seminar: Read More [+]

Rules & Requirements

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of lecture per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: The grading option will be decided by the instructor when the class is offered. Final exam required.

Freshman Seminar: Read Less [-]

ENGIN 25 Visualization for Design 2 Units

Terms offered: Spring 2020, Fall 2019, Spring 2019
Development of 3-dimensional visualization skills for engineering design. Sketching as a tool for design communication. Presentation of 3-dimensional geometry with 2-dimensional engineering drawings. This course will introduce the use of 2-dimensional CAD on computer workstations as a major graphical analysis and design tool. A group design project is required. Teamwork and effective communication are emphasized.
Visualization for Design: Read More [+]

Objectives Outcomes

Course Objectives: Improve 3-dimensional visualization skills; enable a student to create and understand engineering drawings; introduce 2-dimensional computer-aided geometry modeling as a visualization, design, and analysis tool; enhance critical thinking and design skills; emphasize communication skills, both written and oral; develop teamwork skills; offer experience in hands-on engineering projects; develop early abilities in identifying, formulating, and solving engineering problems; introduce students to the societal context of engineering practice.

Student Learning Outcomes: Upon completion of the course, students shall be able to communicate 3-dimensional geometry effectively using sketches; operate 2-dimensional CAD software with a high degree of skill and confidence; understand and create engineering drawings; visualize 3-dimensional geometry from a series of 2-dimensional drawings.

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of lecture and 2 hours of laboratory per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructors: Lieu, McMains

Visualization for Design: Read Less [-]

ENGIN 26 Three-Dimensional Modeling for Design 2 Units

Terms offered: Spring 2020, Fall 2019, Spring 2019
Three-dimensional modeling for engineering design. This course will emphasize the use of CAD on computer workstations as a major graphical analysis and design tool. Students develop design skills, and practice applying these skills. A group design project is required. Hands-on creativity, teamwork, and effective communication are emphasized.
Three-Dimensional Modeling for Design: Read More [+]
Objectives Outcomes

Course Objectives: Introduce computer-based solid, parametric, and assembly modeling as a tool for engineering design;
enhance critical thinking and design skills; emphasize communication skills, both written and oral; develop teamwork skills; offer experience in hands-on, creative engineering projects; reinforce the societal context of engineering practice; develop early abilities in identifying, formulating, and solving engineering problems.

Student Learning Outcomes: Upon completion of the course, students shall be able to operate 3-dimensional solid modeling software tools with a high degree of skill and confidence; specify dimensions for parts and assemblies such that they can be fabricated, and fit such that they function with the desired result; produce rapid-prototype models of parts and assemblies to demonstrate their desired functionality; understand the design of systems, components, and processes to meet desired needs within realistic constraints.

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of lecture and 2 hours of laboratory per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructors: Lieu, McMains, Youssefi

Three-Dimensional Modeling for Design: Read Less [-]

ENGIN 27 Introduction to Manufacturing and Tolerancing 2 Units

Terms offered: Spring 2020, Spring 2019, Fall 2018
Geometric dimensioning and tolerancing (GD&T), tolerance analysis for fabrication, fundamentals of manufacturing processes (metal cutting, welding, joining, casting, molding, and layered manufacturing).
Introduction to Manufacturing and Tolerancing: Read More [+]
Objectives Outcomes

Course Objectives: Enable a student to create and understand tolerances in engineering drawings; enhance critical thinking and design skills; emphasize communication skills, both written and oral; offer hands-on experience in manufacturing; develop abilities in identifying, formulating, and solving engineering problems; introduce students to the context of engineering practice.

Student Learning Outcomes: Upon completion of the course, students shall be able to fabricate basic parts in the machine shop; understand and communicate tolerance requirements in engineering drawings using industry standard GD&T; use metrology tools to evaluate if physical parts are within specified tolerances; demonstrate familiarity with manufacturing processes; and design parts that can be fabricated realistically and economically using these processes.

Rules & Requirements

Prerequisites: ENGIN 25 (http://guide.berkeley.edu/search/?P=ENGIN%2025) (may be taken concurrently)

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of lecture and 3 hours of laboratory per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructors: McMains, Lieu, Taylor

Introduction to Manufacturing and Tolerancing: Read Less [-]

ENGIN 39B Freshman/Sophomore Seminar 1.5 - 4 Units

Terms offered: Spring 2010, Spring 2009, Spring 2008
Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester. Enrollment limits are set by the faculty, but the suggested limit is 25.
Freshman/Sophomore Seminar: Read More [+]

Rules & Requirements

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1.5-4 hours of seminar per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: The grading option will be decided by the instructor when the class is offered. Final exam required.

Freshman/Sophomore Seminar: Read Less [-]

ENGIN 39E Freshman/Sophomore Seminar 1.5 - 4 Units

Terms offered: Spring 2010, Spring 2009, Spring 2008
Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester. Enrollment limits are set by the faculty, but the suggested limit is 25.
Freshman/Sophomore Seminar: Read More [+]

Rules & Requirements

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1.5-4 hours of seminar per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: The grading option will be decided by the instructor when the class is offered. Final exam required.

Freshman/Sophomore Seminar: Read Less [-]

ENGIN 39F Freshman/Sophomore Seminar 1.5 - 4 Units

Terms offered: Fall 2010
Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester. Enrollment limits are set by the faculty, but the suggested limit is 25.
Freshman/Sophomore Seminar: Read More [+]

Rules & Requirements

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1.5-4 hours of seminar per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: The grading option will be decided by the instructor when the class is offered. Final exam required.

Freshman/Sophomore Seminar: Read Less [-]

ENGIN 40 Engineering Thermodynamics 4 Units

Terms offered: Fall 2019, Fall 2018, Fall 2017
Fundamental laws of thermodynamics for simple substances; application to flow processes and to nonreacting mixtures; statistical thermodynamics of ideal gases and crystalline solids; chemical and materials thermodynamics; multiphase and multicomponent equilibria in reacting systems; electrochemistry. Sponsoring Departments: Materials Science and Engineering and Nuclear Engineering.
Engineering Thermodynamics: Read More [+]

Rules & Requirements

Prerequisites: PHYSICS 7B (http://guide.berkeley.edu/search/?P=PHYSICS%207B) and MATH 54 (http://guide.berkeley.edu/search/?P=MATH%2054). CHEM 1B (http://guide.berkeley.edu/search/?P=CHEM%201B) recommended

Credit Restrictions: Students will receive no credit for Engineering 40 after taking Engineering 115, Chemical Engineering 141 or Mechanical Engineering 40.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructors: Bolind, Persson

Engineering Thermodynamics: Read Less [-]

ENGIN 47 Supplementary Work in Lower Division Engineering 1 - 3 Units

Terms offered: Fall 2016, Fall 2012, Spring 2012
May be taken only with permission of the Dean of the College of Engineering. Students with partial credit in a lower division engineering course may complete the work under this heading.
Supplementary Work in Lower Division Engineering: Read More [+]
Rules & Requirements

Prerequisites: Limited to students who must make up a fraction of a required lower division course

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 0 hours of independent study per week

Summer: 8 weeks - 1.5-5.5 hours of independent study per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Supplementary Work in Lower Division Engineering: Read Less [-]

ENGIN 78 Statistics and Data Science for Engineers 4 Units

Terms offered: Not yet offered
This course introduces engineering students to elements of statistics and probability, followed by a module-based introduction to select computational techniques from data science and stochastic optimization. Each module is based on a contemporary engineering problem of broad interest. The computational techniques presented in the course are drawn from Bayesian optimization, supervised learning, neural networks, classification, and Kalman filtering.
Statistics and Data Science for Engineers: Read More [+]
Objectives Outcomes

Course Objectives: Enhance the students' computational skills in tackling engineering problems whose complexity may necessitate data-driven solutions.
Familiarize students with practical concepts of quantitative statistics and probability.
Introduce students to select state-of-the-art algorithms from data science and stochastic optimization in the context of engineering problems.

Student Learning Outcomes: A knowledge of contemporary issues.
An ability to apply knowledge of mathematics, science, and engineering.
An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
An ability to design and conduct experiments, as well as to analyze and interpret data.
An ability to identify, formulate, and solve engineering problems.
An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.

Rules & Requirements

Prerequisites: ENGIN 7 (http://guide.berkeley.edu/search/?P=ENGIN%207), MATH 1A (http://guide.berkeley.edu/search/?P=MATH%201A), MATH 1B (http://guide.berkeley.edu/search/?P=MATH%201B), and MATH 53 (http://guide.berkeley.edu/search/?P=MATH%2053); and MATH 54 (http://guide.berkeley.edu/search/?P=MATH%2054) (may be taken concurrently)

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Papadopoulos

Statistics and Data Science for Engineers: Read Less [-]

ENGIN 92 Perspectives in Engineering 1 Unit

Terms offered: Fall 2019, Fall 2018, Fall 2017
This series of lectures provides students, especially undeclared Engineering students, with information on the various engineering disciplines to guide them toward choice of major. Lecturers describe research activities, how they made their own career choices, and indicate future opportunities. Recommended for all Engineering Science students and required for Engineering undeclared students.
Perspectives in Engineering: Read More [+]

Rules & Requirements

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of lecture per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

Perspectives in Engineering: Read Less [-]

ENGIN 93 Energy Engineering Seminar 1 Unit

Terms offered: Fall 2019, Fall 2018, Fall 2017
Weekly seminar with different speakers on energy-related topics. The goal is to expose students to a broad range of energy issues.
Energy Engineering Seminar: Read More [+]

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of seminar per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

Instructor: Zohdi

Energy Engineering Seminar: Read Less [-]

ENGIN 98 Directed Group Studies for Lower Division Undergraduates 1 - 4 Units

Terms offered: Spring 2020, Fall 2019, Spring 2019
Seminars for group study of selected topics, which will vary from year to year. Intended for students in the lower division.
Directed Group Studies for Lower Division Undergraduates: Read More [+]

Rules & Requirements

Prerequisites: Consent of instructor

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of directed group study per week

Summer:
6 weeks - 2.5-10 hours of directed group study per week
8 weeks - 1.5-7.5 hours of directed group study per week
10 weeks - 1.5-6 hours of directed group study per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

Directed Group Studies for Lower Division Undergraduates: Read Less [-]

ENGIN 117 Methods of Engineering Analysis 3 Units

Terms offered: Fall 2019, Fall 2017, Fall 2015
Methods of theoretical engineering analysis; techniques for analyzing partial differential equations and the use of special functions related to engineering systems. Sponsoring Department: Mechanical Engineering.
Methods of Engineering Analysis: Read More [+]

Rules & Requirements

Prerequisites: MATH 53 (http://guide.berkeley.edu/search/?P=MATH%2053) and MATH 54 (http://guide.berkeley.edu/search/?P=MATH%2054)

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Methods of Engineering Analysis: Read Less [-]

ENGIN 120 Principles of Engineering Economics 3 Units

Terms offered: Spring 2020, Fall 2019, Spring 2019
Economic analysis for engineering decision making: Capital flows, effect of time and interest rate. Different methods of evaluation of alternatives. Minimum-cost life and replacement analysis. Depreciation and taxes. Uncertainty; preference under risk; decision analysis. Capital sources and their effects. Economic studies.
Principles of Engineering Economics: Read More [+]
Rules & Requirements

Prerequisites: Completion of 60 units of an approved engineering curriculum

Credit Restrictions: Students will receive no credit for Engineering 120 after taking Industrial Engineering 120.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 1 hour of discussion per week

Summer: 8 weeks - 4 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Adler

Principles of Engineering Economics: Read Less [-]

ENGIN 125 Ethics, Engineering, and Society 3 Units

Terms offered: Spring 2020, Spring 2014, Fall 2013
How should engineers analyze and resolve the ethical issues inherent in engineering? This seminar-style course provides an introduction to how theories, concepts, and methods from the humanities and social science can be applied to ethical problems in engineering. Assignments incorporate group and independent research designed to provide students an opportunity to contribute novel findings to the emerging field of engineering ethics while building their analytical and communication skills. This course cannot be used to fulfill any engineering technical requirements (units or courses).
Ethics, Engineering, and Society: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 1 hour of discussion per week

Summer:
6 weeks - 5 hours of lecture and 3 hours of discussion per week
8 weeks - 4 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Ethics, Engineering, and Society: Read Less [-]

ENGIN 128 Advanced Engineering Design Graphics 3 Units

Terms offered: Fall 2019, Fall 2018, Fall 2017
Advanced graphics tools for engineering design. Parametric solid modeling. Assembly modeling. Presentation using computer animation and multimedia techniques.
Advanced Engineering Design Graphics: Read More [+]
Rules & Requirements

Prerequisites: ENGIN 26 (http://guide.berkeley.edu/search/?P=ENGIN%2026)

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 3 hours of laboratory per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Instructor: Lieu

Advanced Engineering Design Graphics: Read Less [-]

ENGIN 147 Supplementary Work in Upper Division Engineering 1 - 3 Units

Terms offered: Fall 2016, Fall 2015, Spring 2015
May be taken only with permission of the Dean of the College of Engineering. Students with partial credit in an upper division engineering course may complete the work under this heading.
Supplementary Work in Upper Division Engineering: Read More [+]
Rules & Requirements

Prerequisites: Limited to students who must make up a fraction of a required upper division course

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 0 hours of independent study per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Supplementary Work in Upper Division Engineering: Read Less [-]

ENGIN 150 Basic Modeling and Simulation Tools for Industrial Research Applications 3 Units

Terms offered: Fall 2019, Fall 1997, Fall 1996
The course emphasizes elementary modeling, numerical methods & their implementation on physical problems motivated by phenomena that students are likely to encounter in their careers, involving biomechanics, heat-transfer, structural analysis, control theory, fluid-flow, electrical conduction, diffusion, etc. This will help students develop intuition about the strengths and weaknesses of a variety of modeling & numerical methods, as well as develop intuition about modeling physical systems & strengths and weaknesses of a variety of numerical methods, including: Discretization of differential equations, Methods for solving nonlinear systems, Gradient-based methods and machine learning algorithms for optimization, stats & quantification
Basic Modeling and Simulation Tools for Industrial Research Applications: Read More [+]

Rules & Requirements

Prerequisites: ENGIN 7 (http://guide.berkeley.edu/search/?P=ENGIN%207) or COMPSCI 61A (http://guide.berkeley.edu/search/?P=COMPSCI%2061A), PHYSICS 7A (http://guide.berkeley.edu/search/?P=PHYSICS%207A), MATH 53 (http://guide.berkeley.edu/search/?P=MATH%2053), and MATH 54 (http://guide.berkeley.edu/search/?P=MATH%2054)

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Basic Modeling and Simulation Tools for Industrial Research Applications: Read Less [-]

ENGIN 157AC Engineering, The Environment, and Society 4 Units

Terms offered: Spring 2020, Spring 2019, Spring 2018
This course engages students at the intersection of environmental justice, social justice, and engineering to explore how problems that are commonly defined in technical terms are at their roots deeply socially embedded. Through partnerships with community-based organizations, students are trained to recognize the socio-political nature of technical problems so that they may approach solutions in ways that prioritize social justice. Topics covered include environmental engineering as it relates to air, water, and soil contamination; race, class, and privilege; expertise; ethics; and engaged citizenship. This course cannot be used to complete any engineering technical unit requirements.
Engineering, The Environment, and Society: Read More [+]

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Also listed as: IAS 157AC

Engineering, The Environment, and Society: Read Less [-]

ENGIN 177 Advanced Programming with MATLAB 3 Units

Terms offered: Spring 2017, Spring 2015, Spring 2014
The course builds an understanding, demonstrates engineering uses, and provides hand-on experience for object-oriented programming as well as exposes a practical knowledge of advanced features available in MATLAB. The course will begin with a brief review of basic MATLAB features and quickly move to class organization and functionality. The introduced concepts are reinforced by examining the advanced graphical features of MATLAB. The material will also include the effective use of programs written in C and FORTRAN, and will cover SIMULINK, a MATLAB toolbox providing for an effective ways of model simulations. Throughout the course, the emphasis will be placed on examples and homework assignments from engineering disciplines.
Advanced Programming with MATLAB: Read More [+]

Rules & Requirements

Prerequisites: ENGIN 7 (http://guide.berkeley.edu/search/?P=ENGIN%207), MATH 53 (http://guide.berkeley.edu/search/?P=MATH%2053) and MATH 54 (http://guide.berkeley.edu/search/?P=MATH%2054) (one of these math courses may be taken concurrently)

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructors: Frenklach, Packard

Advanced Programming with MATLAB: Read Less [-]

ENGIN 180 Preparing for the Fields and Jobs of the Future 3 Units

Terms offered: Spring 2018
The course is concerned with giving students the tools to prepare for the fields and jobs of the future.
Across all university departments and majors, the numbers of students who do not work in the fields in which they've received their degrees is not only significant, but growing. For example, anywhere from 20-40% of STEM graduates do not work in the fields in which they received their degrees.
This does not mean that students shouldn't major in STEM, but that one of the primary purposes of higher education is learning how to learn. Accordingly, this course presents a number of frameworks that are critical for thinking about that which has not yet been invented.
Preparing for the Fields and Jobs of the Future: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Alternate method of final assessment during regularly scheduled final exam group (e.g., presentation, final project, etc.).

Instructor: Ian I. Mitroff

Preparing for the Fields and Jobs of the Future: Read Less [-]

ENGIN 185 The Art of STEM Communication 3 Units

Terms offered: Spring 2020, Fall 2019, Spring 2019
This course provides engineering majors with the fundamental skills for effective technical communication. During the course of the semester, students will develop communications for public dissemination, covering a project or initiative within UC Berkeley's College of Engineering. This work will call on students to: (a) cultivate interest in a broad range of topics related to Engineering; (b) become an engaged and critical reader of academic and general-interest science publications; (c) learn how to assess, plan for, and respond to a variety of communicative situations; (d) produce focused, and at the same time, narratively-rich, accounts of Engineering research.
The Art of STEM Communication: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Alternate method of final assessment during regularly scheduled final exam group (e.g., presentation, final project, etc.).

The Art of STEM Communication: Read Less [-]

ENGIN 187 Global Engineering: The Challenges of Globalization and Disruptive Innovation 1 or 2 Units

Terms offered: Fall 2019
The course examines the challenges of innovation beyond new technology development: from the challenges of global expansion, to the issues of unintended consequences of technology and the ability of technology to support or hinder social justice. The course will provide examples in a variety of global locations (e.g., Latin America, Southeast Asia, Africa, China, and India), utilizing case examples (written and presented by speakers) that illustrate the challenges faced in a range of fields of engineering and technology, from water and transportation to information and communications technology, and from start-ups to major corporations, government entities, and policy makers.
Global Engineering: The Challenges of Globalization and Disruptive Innovation: Read More [+]
Rules & Requirements

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 8 weeks - 2-4 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Global Engineering: The Challenges of Globalization and Disruptive Innovation: Read Less [-]

ENGIN 194 Undergraduate Research 3 Units

Terms offered: Spring 2020, Spring 2019, Spring 2018
Students who have completed a satisfactory number of advanced courses may pursue original research under the direction of one of the members of the staff. Final report and presentation required.
Undergraduate Research: Read More [+]
Rules & Requirements

Prerequisites: Consent of instructor and adviser, junior or senior standing

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 0 hours of independent study per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Undergraduate Research: Read Less [-]

ENGIN 198 Directed Group Studies for Advanced Undergraduates 1 - 4 Units

Terms offered: Spring 2020, Spring 2019, Fall 2018
Group study of selected topics.
Directed Group Studies for Advanced Undergraduates: Read More [+]
Rules & Requirements

Prerequisites: Upper division standing, plus particular courses to be specified by instructor

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of directed group study per week

Summer: 8 weeks - 1.5-7.5 hours of directed group study per week

Additional Details

Subject/Course Level: Engineering/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

Directed Group Studies for Advanced Undergraduates: Read Less [-]

ENGIN 201 Graduate Ocean Engineering Seminar 2 Units

Terms offered: Spring 2020, Spring 2019, Spring 2018
Lectures on new developments in ocean, offshore, and arctic engineering.
Graduate Ocean Engineering Seminar: Read More [+]
Objectives Outcomes

Course Objectives: To provide exposure of the field of ocean engineering, arctic engineering and related subject areas to students at graduate level with intention to show the broad and interdisciplinary nature of this field, particularly recent or new developments.

Student Learning Outcomes: Students will learn of new developments in ocean, offshore, and arctic engineering, connecting much of what is learned in other courses to practical applications and active research topics.

Rules & Requirements

Repeat rules: Course may be repeated for credit with instructor consent.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructors: Makiharju, Alam

Graduate Ocean Engineering Seminar: Read Less [-]

ENGIN 230 Methods of Applied Mathematics 3 Units

Terms offered: Fall 2015, Fall 2014, Fall 2013
Topics include complex variable methods, contour integration, solution of Laplace's equation via analytic function theory; asymptotic methods for evaluating integrals and solving differential equations; introduction to calculus of variations with applications; introductory integral equations. The course is intended to expose students in engineering and physical sciences to a range of methods for solving equations associated with mathematical models of physical processes.
Methods of Applied Mathematics: Read More [+]
Rules & Requirements

Prerequisites: MATH 54 (http://guide.berkeley.edu/search/?P=MATH%2054) or equivalent. ENGIN 117 (http://guide.berkeley.edu/search/?P=ENGIN%20117) or equivalent is desirable but not mandatory

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Instructor: Steigmann

Methods of Applied Mathematics: Read Less [-]

ENGIN 231 Mathematical Methods in Engineering 3 Units

Terms offered: Fall 2019, Fall 2018, Fall 2017
This course offers an integrated treatment of three topics essential to modern engineering: linear algebra, random processes, and optimization. These topics will be covered more rapidly than in separate undergraduate courses covering the same material, and will draw on engineering examples for motivation. The stress will be on proofs and computational aspects will also be highlighted. It is intended for engineering students whose research focus has a significant mathematical component, but who have not previously had a thorough exposure to these topics.
Mathematical Methods in Engineering: Read More [+]
Rules & Requirements

Prerequisites: MATH 1A (http://guide.berkeley.edu/search/?P=MATH%201A), MATH 1B (http://guide.berkeley.edu/search/?P=MATH%201B), MATH 53 (http://guide.berkeley.edu/search/?P=MATH%2053) and MATH 54 (http://guide.berkeley.edu/search/?P=MATH%2054) (or equivalent coursework)

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Instructors: Packard, Poolla

Mathematical Methods in Engineering: Read Less [-]

ENGIN C233 Applications of Parallel Computers 3 Units

Terms offered: Spring 2020, Spring 2019, Spring 2018
Models for parallel programming. Overview of parallelism in scientific applications and study of parallel algorithms for linear algebra, particles, meshes, sorting, FFT, graphs, machine learning, etc. Survey of parallel machines and machine structures. Programming shared- and distributed-memory parallel computers, GPUs, and cloud platforms. Parallel programming languages, compilers, libraries and toolboxes. Data partitioning techniques. Techniques for synchronization and load balancing. Detailed study and algorithm/program development of medium sized applications.
Applications of Parallel Computers: Read More [+]
Rules & Requirements

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of laboratory per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Instructors: Demmel, Yelick

Also listed as: COMPSCI C267

Applications of Parallel Computers: Read Less [-]

ENGIN 266A Finite Difference Methods for Fluid Dynamics 4 Units

Terms offered: Fall 2012, Fall 2010, Spring 2007
Application of finite difference methods to current problems of fluid dynamics, including compressible and incompressible flow. Sponsoring department: Mechanical Engineering.
Finite Difference Methods for Fluid Dynamics: Read More [+]
Rules & Requirements

Prerequisites: A graduate-level course in fluid dynamics or numerical methods for differential equations, or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture, 1 hour of discussion, and 3 hours of laboratory per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Instructor: Marcus

Formerly known as: 266

Finite Difference Methods for Fluid Dynamics: Read Less [-]

ENGIN 266B Spectral Methods for Fluid Dynamics 4 Units

Terms offered: Spring 2020, Spring 2018, Fall 2015
Application of spectral methods to current problems of fluid dynamics, including compressible and incompressible flow. Sponsoring department: Mechanical Engineering.
Spectral Methods for Fluid Dynamics: Read More [+]
Rules & Requirements

Prerequisites: A graduate-level course in fluid dynamics or numerical methods for differential equations, or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture, 1 hour of discussion, and 3 hours of laboratory per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Instructor: Marcus

Formerly known as: 266

Spectral Methods for Fluid Dynamics: Read Less [-]

ENGIN 270A Organizational Behavior for Engineers 1 Unit

Terms offered: Fall 2019, Fall 2018, Fall 2017
Designed for professionally-oriented engineering graduate students, this course explores key topics in organizational behavior, including negotiations, power and conflict.
Organizational Behavior for Engineers: Read More [+]
Rules & Requirements

Prerequisites: Admission to MEng or MTM program

Hours & Format

Fall and/or spring: 2 weeks - 6-8 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Organizational Behavior for Engineers: Read Less [-]

ENGIN 270B R&D Technology Management & Ethics 1 Unit

Terms offered: Fall 2019, Fall 2018, Fall 2017
Designed for professionally-oriented engineering graduate students, this course explores key topics in R&D technology management and ethics through faculty-led case analysis and discussion.
R&D Technology Management & Ethics: Read More [+]
Rules & Requirements

Prerequisites: Admission to MEng or MTM program

Hours & Format

Fall and/or spring: 2 weeks - 6-8 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

R&D Technology Management & Ethics: Read Less [-]

ENGIN 270C Teaming & Project Management 1 Unit

Terms offered: Fall 2019, Fall 2018, Spring 2018
Designed for professionally-oriented engineering graduate students, this course applies key topics in project management and team dynamics to students concurrent capstone projects.
Teaming & Project Management: Read More [+]
Rules & Requirements

Prerequisites: Admission to MEng or MTM program

Repeat rules: Course may be repeated for credit up to a total of 1 time.

Hours & Format

Fall and/or spring:
8 weeks - 1.5 hours of lecture per week
12 weeks - 1 hour of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Teaming & Project Management: Read Less [-]

ENGIN 270D Entrepreneurship for Engineers 1 Unit

Terms offered: Spring 2020, Spring 2019, Spring 2018
Designed for professionally-oriented engineering graduate students, this course explores key topics in entrepreneurship and entrepreneurial finance.
Entrepreneurship for Engineers: Read More [+]
Rules & Requirements

Prerequisites: Admission to MEng or MTM program

Hours & Format

Fall and/or spring: 2 weeks - 6-8 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Entrepreneurship for Engineers: Read Less [-]

ENGIN 270E Technology Strategy & Industry Analysis 1 Unit

Terms offered: Spring 2017
Designed for professionally-oriented engineering graduate students, this course explores key topics in technology strategy and industry analysis.
Technology Strategy & Industry Analysis: Read More [+]
Rules & Requirements

Prerequisites: Admission to MEng or MTM program

Hours & Format

Fall and/or spring: 2 weeks - 6-8 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Technology Strategy & Industry Analysis: Read Less [-]

ENGIN 270F Data Analytics 1 Unit

Terms offered: Spring 2017
Designed for professionally-oriented engineering graduate students, this course explores key topics in data analytics.
Data Analytics: Read More [+]
Rules & Requirements

Prerequisites: Admission to MEng or MTM program

Hours & Format

Fall and/or spring: 2 weeks - 6-8 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Data Analytics: Read Less [-]

ENGIN 270G Marketing & Product Management 1 Unit

Terms offered: Spring 2020, Spring 2019, Spring 2018
Designed for professionally-oriented engineering graduate students, this course explores key topics in marketing and product management.
Marketing & Product Management: Read More [+]

Rules & Requirements

Prerequisites: Admission to MEng or MTM program

Hours & Format

Fall and/or spring: 2 weeks - 6-8 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Marketing & Product Management: Read Less [-]

ENGIN 270H Accounting & Finance for Engineers 1 Unit

Terms offered: Spring 2020, Spring 2019, Fall 2017
Designed for professionally-oriented engineering graduate students, this course explores key topics in accounting and finance.
Accounting & Finance for Engineers: Read More [+]

Rules & Requirements

Prerequisites: Enrollment in MEng or MTM programs

Hours & Format

Fall and/or spring:
2 weeks - 7.5 hours of lecture per week
7 weeks - 2 hours of lecture per week
10 weeks - 1.5 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Accounting & Finance for Engineers: Read Less [-]

ENGIN 270I Digital Platform Strategy for Engineering Leaders 1 Unit

Terms offered: Spring 2020, Spring 2019, Spring 2018
Designed for MEng and MTM students, this course explores key topics using the case discussion method. We will discuss technology strategy with the following meta themes; we will open with a case that applies traditional strategy analysis, contrast the traditional framework with new conceptions of platforms and competition. We'll come to understand traditional economies of scale and barriers to entry and contrast those with network dynamics, winner take all markets, and platform strategy. Finally, we will critique platform competition and debate how platforms and their competitive dynamics will change business and society.
Digital Platform Strategy for Engineering Leaders: Read More [+]

Rules & Requirements

Prerequisites: Enrollment in the MEng or MTM programs

Hours & Format

Fall and/or spring: 2 weeks - 7 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Digital Platform Strategy for Engineering Leaders: Read Less [-]

ENGIN 270J Industry Analysis for Engineering Leaders 1 Unit

Terms offered: Spring 2020, Spring 2019, Spring 2018
Designed for professionally-oriented engineering graduate students, this course explores key topics in industry analysis.
Industry Analysis for Engineering Leaders: Read More [+]

Rules & Requirements

Prerequisites: Enrollment in the MEng or MTM programs

Hours & Format

Fall and/or spring: 2 weeks - 7 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Industry Analysis for Engineering Leaders: Read Less [-]

ENGIN 270L Global Leadership Expertise 1 Unit

Terms offered: Spring 2020
The objective of this course is to provide Master of Engineering and Master of Translational Medicine students with insights into the type of leadership skills required to be a successful cross-cultural leader in today's increasingly complex global marketplace.
Global Leadership Expertise: Read More [+]
Objectives Outcomes

Course Objectives: Over the course of this intensive boot camp, students will be required to employ technical abilities and multidisciplinary analysis while examining and engaging in case studies, simulations, and in-class exercises in order to achieve some key course goals:
• Develop a global mindset
• Become more interculturally competent
• Learn to lead people from different cultures
• Understand the implications of global leadership

Student Learning Outcomes: The goal is for each student to develop a personalized global leadership "toolkit" that they will be able utilize as their professional careers unfold. There will be a specific focus on how to deploy that “toolkit” to assist with business decision making in the fiduciary context.

Rules & Requirements

Prerequisites: Enrollment in the MEng or MTM programs

Hours & Format

Fall and/or spring: 2 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Instructor: Himelstein

Global Leadership Expertise: Read Less [-]

ENGIN 270M Professional Ethics in Technology, Law and Business 1 Unit

Terms offered: Spring 2020
Designed for MEng and MTM students. Over the course of the boot camp, students will gain proficiency in verbal leadership, through discussions of technology, legal and business case studies. Topics will include technology management, governance, privacy and disclosure, codes of conduct, whistleblowing, internal investigations, ethical and effective business practices in foreign countries, and ethical and effective leadership.
Professional Ethics in Technology, Law and Business: Read More [+]
Objectives Outcomes

Course Objectives: Students will be required to employ technical and qualitative analysis while digesting and dissecting case studies, in-class projects, and guest speaker presentations. Class discussions will focus on issues raised in case studies, including analysis, brainstorming, diagnosis, and recommendations.

Student Learning Outcomes: Students will gain exposure to a wide variety of leadership approaches, technologies, personalities, and business models.

Rules & Requirements

Prerequisites: Enrollment in the MEng or MTM programs

Hours & Format

Fall and/or spring: 2 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Professional Ethics in Technology, Law and Business: Read Less [-]

ENGIN W270K Coaching for High Performance Teams 1 Unit

Terms offered: Spring 2020, Spring 2019
Designed for professionally-oriented engineering graduate students, this course applies key topics in project management and team dynamics to students concurrent capstone projects.
Coaching for High Performance Teams: Read More [+]
Rules & Requirements

Prerequisites: Open to MEng or MTM students only

Hours & Format

Fall and/or spring: 8 weeks - 0.5 hours of workshop and 0.5 hours of web-based lecture per week

Online: This is an online course.

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Instructor: Beliaev

Coaching for High Performance Teams: Read Less [-]

ENGIN 271 Engineering Leadership I 3 Units

Terms offered: Fall 2015, Fall 2014, Fall 2013
Designed for professionally-oriented engineering graduate students, this course explores key management and leadership concepts relevant to technology-dependent enterprises. Topics include opportunity recognition, strategies for effective R and D, marketing innovation, disruption, cognitive inertia, product management, market selection, standards wars, two-sided markets, attracting stakeholders, business models, pricing strategies.
Engineering Leadership I: Read More [+]
Rules & Requirements

Prerequisites: Admission to the MEng Program

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Instructors: Flemming, Lee

Engineering Leadership I: Read Less [-]

ENGIN 272 Engineering Leadership II 3 Units

Terms offered: Spring 2016, Spring 2015, Spring 2014
Designed for professionally-oriented engineering graduate level students, this course explores key operational, leadership, and financial concepts relevant to technology-dependent enterprises. Topics include methods to go to market, direct and indirect sales, logistics, talent management, managing creativity, project management, leadership styles, CFO-style interpretation of financial statements, funding sources, budgeting, and valuation methods.
Engineering Leadership II: Read More [+]
Rules & Requirements

Prerequisites: Admission to MEng Program and 271

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Engineering Leadership II: Read Less [-]

ENGIN C282 Charged Particle Sources and Beam Technology 3 Units

Terms offered: Spring 2020, Spring 2018, Fall 2015, Fall 2013, Fall 2011
Topics in this course will include the latest technology of various types of ion and electron sources, extraction and formation of charge particle beams, computer simulation of beam propagation, diagnostics of ion sources and beams, and the applications of beams in fusion, synchrotron light source, neutron generation, microelectronics, lithography, and medical therapy. This is a general accelerator technology and engineering course that will be of interest to graduate students in physics, electrical engineering, and nuclear engineering.
Charged Particle Sources and Beam Technology: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Instructors: Leung, Steier

Also listed as: NUC ENG C282

Charged Particle Sources and Beam Technology: Read Less [-]

ENGIN 290 Special Topics in Management of Technology 2 or 3 Units

Terms offered: Spring 2012, Fall 2011, Spring 2011
Specific topics, hours and units of credit will vary from section to section, year to year. Courses are related classes in the Management of Technology certificate program.
Special Topics in Management of Technology: Read More [+]

Rules & Requirements

Prerequisites: Graduate standing

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2-3 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Special Topics in Management of Technology: Read Less [-]

ENGIN 290A Introduction to Management of Technology 3 Units

Terms offered: Spring 2012, Spring 2011, Spring 2010
This course is designed to give students a broad overview of the main topics encompassed by management of technology. It includes the full chain of innovative activities beginning with research and development and extending through production and marketing. Why do many existing firms fail to incorporate new technology in a timely manner? At each stage of innovation, we examine key factors determining successful management of technology. What constitutes a successful technology strategy? The integrating course focus will be on the emergence of the knowledge economy and technology as a key knowledge asset and will involve both general readings and cases. The course also introduces students to Haas and COE faculty working in the relevant areas.
Introduction to Management of Technology: Read More [+]

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Instructor: Proctor

Introduction to Management of Technology: Read Less [-]

ENGIN 290B Biotechnology: Industry Perspectives and Business Development 2 Units

Terms offered: Fall 2011, Fall 2010, Fall 2009
This course is designed to examine the strategic issues that confront the management of the development stage biotech company, i.e., after its start-up via an initial capital infusion, but before it might be deemed successful (e.g., by virtue of a product launch), or otherwise has achieved "first-tier" status. Thus, the intention is to study the biotech organization during the process of it growth and maturation from an early stage existence through "adolescence" into an "adult" company. The focus of the class will be on business development, i.e., the deal making that must occur to accomplish the corporate objectives of bringing in new technologies and getting the initial products to market. We will explore the critical deal issues from both the perspective of the development stage company and the viewpoint of the larger, more mature biotech or big pharma company with which it seeks to partner.
Biotechnology: Industry Perspectives and Business Development: Read More [+]

Rules & Requirements

Credit Restrictions: Students will receive no credit for 290E after taking Master of Business Administration 290B or Evening Weekend Master of Business Administration 290B.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Instructors: Hoover, Sanders

Biotechnology: Industry Perspectives and Business Development: Read Less [-]

ENGIN 290E Marketing Emerging Technologies 3 Units

Terms offered: Fall 2011, Fall 2010

The primary goal of this course is to develop in the student the marketing skills needed to compete aggressively as an entrepreneur in technology fields. Upon completion of the course, the student should have developed the following skills: the ability to assess and predict customer needs in markets that may not yet exist; the ability to create and execute marketing plans that necessarily integrate sophisticated technological development with rapidly evolving customer requirements; the ability to create and grow a focused marketing organization rapidly and efficiently; and the ability to create and use marketing communications to reach prospects, customers, OEMs, and sales channels efficiently and inexpensively.

Marketing Emerging Technologies: Read More [+]

Rules & Requirements

Credit Restrictions: Students will receive no credit for 290E after taking Master of Business Administration 290E.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Instructor: Isaacs

Marketing Emerging Technologies: Read Less [-]

ENGIN 290G International Trade and Competition in High Technology 3 Units

Terms offered: Prior to 2007

This course seeks to make sense of, inter alia, the decline and prospective recovery of U.S. high-technology industries, the evolution of innovation and technology strategies and policies in Western Europe and Asia, the historic and current roles of governments in shaping markets for high-technology goods, and the impact on business strategies of recent developments in early-stage capital markets. Our general approach views technological innovation and competition as dynamic processes that reflect previous choices made by firms and governments. Modern technologies develop in markets that are international scope, often imperfectly competitive, and subject to influence by a variety of economic and political stakeholders. We will use an eclectic mix of theoretical, historical, and practical perspectives throughout the course in examining these issues, although no special familarity with any of these is assumed. From time to time, we will be joined by venture capitalists, corporate executives, and technologists engaged in global high-technology markets for discussion of these issues.

International Trade and Competition in High Technology: Read More [+]

Rules & Requirements

Credit Restrictions: Students will receive no credit for 290G after taking Master of Business Administration 290G.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Instructor: Wu

International Trade and Competition in High Technology: Read Less [-]

ENGIN 290H Management of Technology - Doing Business in China 2 Units

Terms offered: Fall 2009
This course prepares students to found a startup business in China or to work with an MNC in China, develops their critical analysis and strategic decision tools and skills needed to compete in the world's most dynamic emerging market, and provides access and useful introductions/Guanxi to aid future business development in China.
Management of Technology - Doing Business in China: Read More [+]
Rules & Requirements

Credit Restrictions: Students will receive no credit for 290H after taking Master of Business Administration 290H.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Instructor: Sanderson

Management of Technology - Doing Business in China: Read Less [-]

ENGIN 290J Entrepreneurship in Biotechnology 2 Units

Terms offered: Spring 2012, Spring 2011, Spring 2010
This course will provide students an introduction to the complexities and unique problems of starting a life sciences company. It is designed for both entrepreneurs and students who may someday work in a biotechnology or medical device startup. Students will be exposed to the topics most critical for successfully founding, financing, and operating a life science company, and will be expected to perform many of the same tasks that founders would normally undertake. Discussions with life-science entrepreneurs, case studies of recent companies, and hands-on work developing entrepreneurial endeavors will all be utilized.
Entrepreneurship in Biotechnology: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Instructor: Lasky

Entrepreneurship in Biotechnology: Read Less [-]

ENGIN 290O Opportunity Recognition: Technology and Entrepreneurship in Silicon Valley 3 Units

Terms offered: Spring 2012, Fall 2011, Spring 2011
This course is intended to provide the core skills needed for the identification of opportunities that can lead to successful, entrepreneurial high technology ventures, regardless of the individual's "home" skill set, whether technical or managerial. We examine in depth the approaches most likely to succeed for entrepreneurial companies as a function of markets and technologies. Emphasis is placed on the special requirements for creating and executing strategy in a setting of rapid technological change and limited resources. This course is open to both MBA and Engineering students (who enroll through the College of Engineering), and is particularly suited for those who anticipate founding or operating technology companies.
Opportunity Recognition: Technology and Entrepreneurship in Silicon Valley: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Opportunity Recognition: Technology and Entrepreneurship in Silicon Valley: Read Less [-]

ENGIN 290P Project Management 2 Units

Terms offered: Spring 2012, Spring 2011, Spring 2010
This course will provide you with a comprehensive view of the elements of modern project management, guidelines for success, and related tools. In organizations today, successful operations keep the organization alive and successful projects move it towards strategic objectives. A project is a one-time or infrequently occurring operation with a unique goal, limited lifespan, and limited resources. The fundamental concepts come from the field of operations management, but projects present special types of operations because of their intended focus, limited lives, constraints, and uncertainties. In organizations today, projects are many, diverse, and frequently overlapping.
Project Management: Read More [+]
Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Project Management: Read Less [-]

ENGIN 290S Supply Chain Management 3 Units

Terms offered: Fall 2011, Fall 2010, Fall 2009
This course involves the flows of materials and information among all of the firms that contribute value to a product, from the source of raw materials to end customers. Elements of supply chain management have been studied and practiced for some time in marketing, logtistics, and operations management. We will attempt to integrate these different perspectives to develop a broad understanding of how to manage a supply change. This course will focus on effective supply chain strategies for companies that operate globally with emphasis on how to plan and integrate supply chain components into a coordinated system. You will be exposed to concepts and models important in supply chain planning with emphasis on key trade offs and phenomena. The course will introduce and utilize key tactics such as risk pooling and inventory placement, integrated planning and collaboration, and information sharing. Lectures, Internet simulations, computer exercises, and case discussions introduce various models and methods for supply chain analysis and optimization.
Supply Chain Management: Read More [+]
Rules & Requirements

Credit Restrictions: Students will receive no credit for 290S after taking Master of Business Administration 248A or Evening Weekend Master of Business Administration 248A.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Instructor: Angelus

Supply Chain Management: Read Less [-]

ENGIN 295 Communications for Engineering Leaders 1 Unit

Terms offered: Spring 2020, Fall 2019, Spring 2019
Engineering leadership principles integrated with concurrent technical capstone projects for Master of Engineering students. Students enroll in this supplementary course while they are enrolled in Engineering 296M, Capstone project, with their technical department capstone advisor. This project-based course will apply communication skills to the capstone project with a focus on presentations and writing in a professional context.
Communications for Engineering Leaders: Read More [+]
Rules & Requirements

Prerequisites: Admission to MEng program or College of Engineering PhD program

Repeat rules: Course may be repeated for credit up to a total of 2 times.

Hours & Format

Fall and/or spring:
2 weeks - 8 hours of lecture per week
8 weeks - 2 hours of lecture per week
10 weeks - 1.5 hours of lecture per week
15 weeks - 1 hour of lecture per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Instructors: Bauer, Fitzpatrick, Halpern, Houlihan

Communications for Engineering Leaders: Read Less [-]

ENGIN W295A Communications for Engineering Leaders 1 Unit

Terms offered: Prior to 2007
Professional communications for Master of Engineering students. The course has two objectives: to develop and/or hone your individual communication skills, as you generate content supporting your career development [fall] and to further your individual and team-based communication skills, as your team generates content for your capstone reporting deliverables [spring].
Communications for Engineering Leaders: Read More [+]
Rules & Requirements

Prerequisites: Restricted to Master of Engineering degree students

Hours & Format

Fall and/or spring: 10 weeks - 0.5 hours of web-based lecture and 0.5 hours of tutorial per week

Online: This is an online course.

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Instructor: Beliaev

Communications for Engineering Leaders: Read Less [-]

ENGIN W295B Communications for Engineering Leaders 1 Unit

Terms offered: Prior to 2007
Professional communications for Master of Engineering students. The course has two objectives: to develop and/or hone your individual communication skills, as you generate content supporting your career development [fall] and to further your individual and team-based communication skills, as your team generates content for your capstone reporting deliverables [spring].
Communications for Engineering Leaders: Read More [+]
Rules & Requirements

Prerequisites: Restricted to Master of Engineering degree students

Hours & Format

Fall and/or spring: 10 weeks - 0.4 hours of web-based lecture and 0.7 hours of workshop per week

Online: This is an online course.

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Instructor: Beliaev

Communications for Engineering Leaders: Read Less [-]

ENGIN 296MA Master of Engineering Capstone Project 1 - 5 Units

Terms offered: Fall 2019, Fall 2018, Fall 2017
This course is the first of a sequence of two capstone project courses for candidates of the Masters of Engineering degree. Students engage in professionally oriented independent or group research or study under the supervision of a research advisor. The research and study synthesizes the technical, environmental, economic, and social issues involved in the design and operation of complex engineering devices, systems, and organization.
Master of Engineering Capstone Project: Read More [+]
Rules & Requirements

Prerequisites: Acceptance into the Master of Engineering program

Hours & Format

Fall and/or spring: 15 weeks - 1-5 hours of seminar per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: The grading option will be decided by the instructor when the class is offered.

Master of Engineering Capstone Project: Read Less [-]

ENGIN 296MB Master of Engineering Capstone Project 1 - 5 Units

Terms offered: Spring 2019, Spring 2018, Spring 2017
This course is the second of a sequence of two capstone project courses for candidates of the Masters of Engineering degree. Students engage in professionally oriented independent or group research or study under the supervision of a research advisor. The research and study synthesizes the technical, environmental, economic, and social issues involved in the design and operation of complex engineering devices, systems, and organizations.
Master of Engineering Capstone Project: Read More [+]
Rules & Requirements

Prerequisites: 296MA

Hours & Format

Fall and/or spring: 15 weeks - 1-5 hours of seminar per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: The grading option will be decided by the instructor when the class is offered.

Master of Engineering Capstone Project: Read Less [-]

ENGIN 298 Fung Institute Engineering Leadership Speaker Series 1 Unit

Terms offered: Fall 2019
This lecture series serves as an inspirational supplement to Master of Engineering graduate curriculum in leadership and innovation. The course features insightful conversations with high-level industry speakers who share their experience with engineering leadership and innovation. Speakers draw from Silicon Valley leadership, Fung Institute capstone project partners and advisory board, MEng Alumni featured in Forbes 30 under 30 and Inc's Top 50 Young Entrepreneur's to watch.
Fung Institute Engineering Leadership Speaker Series: Read More [+]
Rules & Requirements

Prerequisites: Enrollment in the Master of Engineering program

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1.5 hours of colloquium per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Fung Institute Engineering Leadership Speaker Series: Read Less [-]

ENGIN 298A Group Studies or Seminars 1 - 6 Units

Terms offered: Fall 2015, Fall 2014, Fall 2013
Advanced group studies or seminars in subjects which are interdisciplinary in the various fields of engineering or other sciences associated with engineering problems. Topics which form the basis of seminars will be announced at the beginning of each semester.
Group Studies or Seminars: Read More [+]
Rules & Requirements

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-6 hours of seminar per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Letter grade.

Group Studies or Seminars: Read Less [-]

ENGIN 298B Group Studies or Seminars 1 - 6 Units

Terms offered: Spring 2016, Fall 2015, Spring 2015
Advanced group studies or seminars in subjects which are interdisciplinary in the various fields or engineering or other sciences associated with engineering problems. Topics which form the basis of seminars will be announced at the beginning of each semester.
Group Studies or Seminars: Read More [+]
Rules & Requirements

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 0 hours of seminar per week

Additional Details

Subject/Course Level: Engineering/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Group Studies or Seminars: Read Less [-]