Engineering Systems Analysis for Design
(Offered under: 1.146, 16.861, ESD.71)
(Subject meets with ESD.710)
Prereq: 1.145 or permission of instructor
Acad Year 2014–2015: Not offered
Acad Year 2015–2016: G (Fall)
3-0-9 H-LEVEL Grad Credit
Covers theory and methods to identify, value, and implement flexibility in design, also known as “real options.” Topics include definition of uncertainties, simulation of performance for scenarios, screening models to identify desirable flexibility, decision and lattice analysis, and multidimensional economic evaluation. Students demonstrate proficiency through an extended application to a systems design of their choice. Provides a complement to research or thesis projects. Meets with ESD.710 first half of term.
R. de Neufville

Ethics for Engineers
(Offered under: 1.082, 2.900, 10.01)
Prereq: None
U (Fall)
2-0-4
Integrates classical readings that provide an overview of ethics with a survey of case studies that focus on ethical problems arising in the practice of engineering. Readings taken from a variety of sources, such as Aristotle, Machiavelli, Bacon, Hobbes, Locke, the Founding Fathers, and the Bible. Case studies include written analyses and films that address engineering disasters, biotechnology, court cases, ethical codes, and the ultimate scope and aims of engineering.
D. Doneson, B. L. Trout

Introduction to Modeling and Simulation
(Offered under: 1.021, 3.021, 10.333, 22.00)
Prereq: 18.03, 3.016, or permission of instructor
U (Fall)
4-0-8 REST
Basic concepts of computer modeling and simulation in science and engineering. Uses techniques and software for simulation, data analysis and visualization. Continuum, mesoscale, atomistic and quantum methods used to study fundamental and applied problems in physics, chemistry, materials science, mechanics, engineering, and biology. Examples drawn from the disciplines above are used to understand or characterize complex structures and materials, and complement experimental observations.
M. Buehler, M. Demkowicz

Management in Engineering
(Offered under: 2.96, 6.930, 10.806, 16.653)
Prereq: None
U (Fall)
3-1-8
Introduction and overview of engineering management. Financial principles, management of innovation, technical strategy and best management practices. Case study method of instruction emphasizes participation in class discussion. Focus is on the development of individual skills and management tools. Restricted to juniors and seniors.
H. S. Marcus, J.-H. Chun

UPOP Engineering Practice Experience
(Offered under: 1.EPE, 2.EPE, 3.EPE, 6.EPE, 10.EPE, 16.EPE, 20.EPE, 22.EPE)
Prereq: None
U (Fall, Spring)
0-0-1 [P/D/F]
Provides sophomores with guided practice in finding opportunities and excelling in the world of practice. Building on the skills and relationships acquired in the Engineering Practice Workshop, students receive coaching to articulate goals, invoke the UPOP network of mentors and employers, identify and pursue opportunities and negotiate terms of their summer assignment. Students complete a 10-12 week internship, which includes filing three progress reports, conducting one informational interview, and possibly hosting a site visit by MIT staff. Returning to campus as juniors, UPOP students take part in reflective exercises that aid assimilation of learning objectives and reinforce the cognitive link between all aspects of the UPOP experience and disciplinary fields of study. Sequence begins in the spring of sophomore year and ends in the fall of junior year.
Staff

UPOP Engineering Practice Workshop
(Offered under: 1.EPW, 2.EPW, 3.EPW, 6.EPW, 10.EPW, 16.EPW, 20.EPW, 22.EPW)
Prereq: None
U (Fall, IAP)
1-0-0 [P/D/F]
Develops foundational skills for the world of practice in science, technology, and engineering. Sophomores receive classroom instruction, and one-on-one and small-group coaching in basics of professional identity building. They attend field trips to local employers and receive job interview practice, coached by industry volunteers. Over IAP, students attend a weeklong Team Training Camp of experiential learning modules led by MIT faculty with the help of MIT alums and other senior professionals in business, engineering, and science where students participate in creative simulations, team problem-solving challenges, and oral presentations, and practice networking with employers. Enrollment limited.
Staff