Systems Engineering
Think Connections

Smart Cities and Communities
Urban Transportation Systems
Infrastructure Sensing and Control
Societal Networks
Supply Chains and Logistics

cee.mit.edu
Systems Engineering

Systems Engineering is a contemporary interdisciplinary field in which students learn fundamental tools to design and manage large-scale complex systems over their lifecycles. Follow the Systems Engineering track, within our general engineering degree program, to apply rigorous modeling and decision-making principles to emerging societal-scale systems.

Systems Engineering Track
With a career focus on Sustainable Buildings and Cities.

"I want to join a growing company, so I can use my passion to push the type of infrastructure that I believe we need to make a real impact on peoples’ lives everywhere.”
Anthony McHugh ’16

Example Subject Roadmap:

**Sophomore Fall Term**
- 1.010 Uncertainty in Engineering
- 1.101 Introduction to Civil and Environmental Engineering Design I
- 18.03 Differential Equations
- 1.000 Computer Programming for Engineering Applications
- HASS (5) 12

**Sophomore Spring Term**
- Core Elective
- 1.00 Engineering Computation and Data Science
- 1.102 Introduction to Civil and Environmental Engineering Design II
- 1.074 Multivariate Data Analysis (second half of term)
- HASS (4) 12

**Junior Fall Term**
- 1.011 Project Evaluation and Management, CI-M
- 1.032 Intro to Network Models
- HASS (6) 12

**Junior Spring Term**
- 1.053J Dynamics of Control I
- 1.020 Engineering Sustainability: Analysis and Design
- 1.041 Transportation Systems Modeling
- HASS (8) 12

**Senior Fall Term**
- 6.041A&6.041B Intro to Probability
- 6.003 Signals and Systems or 6.041A&6.041B Intro to Probability
- Unrestricted Elective (4)
- HASS (7) 12

**Senior Spring Term**
- 1.073 Senior Civil and Environmental Engineering Design, CI-M
- 1.153 Transportation Policy, the Environment, and Livable Communities
- 15.053 Optimization Methods in Business Analytics
- 6.207 Networks

Degree requirements include satisfactorily fulfilling both MIT’s General Institute Requirements (GIRs) below and CEE’s Departmental Program:

- Track = General Department Requirements (GDR) + Core Subjects + Restricted Electives + General Interdisciplinary Electives
- Unrestricted Electives (48-54 units)

Choose Unrestricted electives to tailor your degree to gain depth in areas like Cyber-Physical Systems, Transportation Systems and Water Resource Planning and Management.

Subject schedules may change in advance of the start of the term.

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Incoming students got a chance to battle each other in computer-simulated attacks on a public urban network at our Freshman Pre-Orientation Programs (FPOP). CEE Professor Saurabh Amin used an online tool—steeped in data, strategic thinking and mathematical algorithms—to introduce students to Systems Engineering concepts. A burgeoning CEE field, Systems Engineering leverages new sensing, actuation and communications technologies to better manage and control large-scale infrastructure networks. Whether posing as a hacker or defender, students played to win—and learned a lot about a range of infrastructure challenges facing our world today.

Grounded in science and engineering, we understand the world, invent and lead with creative design. We pursue ‘big engineering’ through innovations which may begin locally, but scale broadly and quickly to impact people everywhere. Course 1 at MIT’s unique living and learning environment blurs the distinction between the classroom, the research lab, and real-world applications. Course 1 aims to:

- Make cities more livable, sustainable, and secure;
- Leverage secrets from ocean depths to improve human health;
- Manage impacts of climate change; and
- Reduce waste and preserve natural resources.

Civil Engineer, Innovation Officer, Data Analytics Engineer, Global Insights Consultant or Materials Chemist.
Chief Resiliency Officer, Megacities Urban Planner, Natural Resources Specialist, Climate Change Consultant,
Startup Founder/CEO/CTO, Innovation and Insights Officer, Product Lifecycle Executive, Resource Development Officer,
Professor and Director NGO

Continue your education with a Master’s degree.
Apply to CEE’s 9-month Master of Engineering Program (MEng) to advance your knowledge and prepare for other leadership roles in industry or academia.