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 to apply rigorous modeling and decision-making principles to emerging societal-scale systems.

"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:

<table>
<thead>
<tr>
<th>Track</th>
<th>Sophomore Fall Term</th>
<th>Sophomore Spring Term</th>
<th>Junior Fall Term</th>
<th>Junior Spring Term</th>
<th>Senior Fall Term</th>
<th>Senior Spring Term</th>
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<tr>
<td></td>
<td>1.010 Uncertainty in Engineering</td>
<td>Unrestricted Elective (1) or 1.00 Engineering Computation and Data Science</td>
<td>1.103J Dynamics of Control I</td>
<td>1.01 Senior and Environmental Engineering Design, CI-M</td>
<td>6.003 Signals and Systems or 6.041/6.041B Intro to Probability</td>
<td>1.03 Senior and Environmental Engineering Design, CI-M</td>
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<td>1.101 Introduction to Civil and Environmental Engineering Design I</td>
<td>1.000 Computer Programming for Engineering Applications</td>
<td>1.012 Intro to Network Models</td>
<td>1.013 Transportation Policy, the Environment, and Livable Communities</td>
<td>1.04 Senior and Environmental Engineering Design, CI-M</td>
<td>11.166 Networks</td>
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<td>18.03 Differential Equations</td>
<td>1.03 Water Resource Systems</td>
<td>Unrestricted Elective (2)</td>
<td>15.053 Optimization Methods in Business Analytics</td>
<td>6.003 Signals and Systems or 6.041/6.041B Intro to Probability</td>
<td>1.03 Senior and Environmental Engineering Design, CI-M</td>
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<td>Core (6)</td>
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Degree requirements include satisfactorily fulfilling both MIT’s General Institute Requirements (GIRs) and CEE’s Departmental Program.

Track = General Department Requirements (GDR) + Core Subjects and Labs + Restricted Elective (RE) and Unrestricted Elective (UE)

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

Subject schedules may change in advance of the start of the term.
This is Civil and Environmental Engineering:

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.

Prepare to lead in new and emerging fields with careers like:
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.

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.