Example UROP Projects in Course 1

Environmental Engineering Science	
Project Title	**Faculty Supervisor**
Finding a Genetic System for Prochlorococcus	Chisholm, Sallie
Using Carnivorous Pitcher Plant-Associated Microbes to Develop a Model Ecosystem	Cordero Sanchez, Otto X.
Tracking Microbial Community Evolution with Sourdough	Cordero Sanchez, Otto X.
Design and construction of an automated plant phenotyping system	Des Marais, David Lee
Uncovering ecological and developmental shifts accompanying life history evolution	Des Marais, David Lee
Changing Monsoons and Crop Yields in Sub-Saharan Africa	Entekhabi, Dara
Interpreting Trends in Surface CO and Methane Concentrations	Heald, Colette
Exploring Links Between Extreme Weather and Extreme Pollution	Heald, Colette
Autonomous Ocean Data Collection	Hemond, Harold F.
Water-Climate Change Nexus	Hemond, Harold F.
Motile Bacteria in Viscous Fingering	Juanes, Ruben
Nutrient Cycling	Kocar, Benjamin
Roadside Measurements of Air Pollutant Emissions from Vehicles in an Urban Environment	Kroll, Jesse
Evolutionary Analysis of Burkholderia dolosa in Cystic Fibrosis - Summer Project Phase	Lieberman, Tami
Identify Genetic Variations that Determines Phage-Host Interactions	Nepf, Heidi
Measuring Flow Velocity and Bed Topography with Vegetation and Sediment	Nepf, Heidi
Transposable bacteriophages in genomic datasets	Polz, Martin F.
A Computational Approach to Understanding Phage-driven Microbial Evolution	Polz, Martin F.
On the emergence of developed ecosystem	Saavedra, Serguei
Mechanics and Materials	
Project Title	**Faculty Supervisor**
Bioenergy and Applications from Hydrothermal Liquefaction	Buehler, Markus J.
Structural stability of 3D Printed Designs in composite Materials	Buehler, Markus J.
Molecular Modeling of Disease-Related Metabolite Nanoassemblies	Buehler, Markus J.
Predicting Protein Structure using Machine Learning Methods	Buehler, Markus J.
Embodied Energy analysis of Irradiated Waste Plastic with Cement Paste	Buyukozturk, Oral
Irradiated Recycled Plastic as a Concrete Additive	Buyukozturk, Oral
Analyzing Energies of Fluid Configurations in Porous Rock	Buyukozturk, Oral
Development of a Minimally Invasive Technique for Mechanical Testing of Soft and Biological Materials	Cohen, Tal

Analyzing Flaw Behavior due to Hydraulic Fracturing in Granite	Einstein, Herbert H.
Rock Fracture Characterization	Einstein, Herbert H.
Salinity-Resilient Rhizobium for Sustainable Agriculture	Marelli, Benedetto
Biopreservation of Plant Growth Promoting Bacteria in Anhydrous Environment	Marelli, Benedetto
Crop regulation via silk nanoparticle injection into xylem	Marelli, Benedetto
Structural Implications of the Periodontal Ligament	Masic, Admir
Multiscale Analysis of Luminescence of Egyptian Blue Pigments	Masic, Admir
Computational Optimization and Digital Fabrication of Timber Structures Brief	Mueller, Caitlin T.
Applying Photoelasticity to Structure Optimization Project	Mueller, Caitlin T.
Mars City Design	Mueller, Caitlin T.
Modeling structures with Molecular Dynamics	Ulm, Franz-Josef
Reimagining Spaces: the Pellestrina Workshop	Whittle, Andrew
Systems Engineering	
Project Title	**Faculty Supervisor**
Use of s-UASs for Optimal Detection of Leaks in Gas and Oil Pipelines	Amin, Saurabh
Wind Resilience of Electricity Networks	Amin, Saurabh
Statistical modeling of tropical cyclone wind fields	Amin, Saurabh
Intelligent Constrained Autonomous Strategic Tasking (ICAST)	Amin, Saurabh
Mobility of the Future: Scenario Discovery with SimMobility	Ben-Akiva, Moshe E.
Ride-sharing Using Simulation Frameworks	Ben-Akiva, Moshe E.
Scenario Discovery: Experimental Design and Robustness Classification for Exploring Urban Mobility Futures	Ben-Akiva, Moshe E.
Future Mobility Sensing (FMS)	Ben-Akiva, Moshe E.
Developing and Estimating a Route-Choice Model	Ben-Akiva, Moshe E.
Dynamic Ride-sharing Algorithms Development, Understanding, and Testing	Ben-Akiva, Moshe E.
Characterizing a Gravitationl Rheometer for Viscoelastic Flows	Bourouiba, Lydia
Development of a Portable Gravitational Rheometer	Bourouiba, Lydia
Implementing an Efficient Algorithm for the Calibration of Large Scale Stochastic Traffic Simulators	Osorio, Carolina
Sustainable Supply Chain Management for Palm Oil Sourcing	Sheffi, Yosef
Analysis of MBTA Bus Data	Whittle, Andrew

If you're interested in a UROPing in Course 1, please contact the Academic Programs Office (APO) at cee-apo@mit.edu or contact the faculty member you are interested in conducting a UROP with directly.