

## 15.875 Applications of System Dynamics: Global Challenges

Prerequisite: **15.871**; Units: **3-0-6**

Offered: **Full semester Spring 2010** (scheduled **W 4-7 pm**)

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*In this studio-style class, students draw on system dynamics approaches to define and investigate in depth a specific challenge or opportunity important to a client or other stakeholder. The course pairs a consulting orientation with a system dynamics framing that both guides the process and informs our analytical tools and approach. Projects may entail simulation models or causal loop maps along with a paper and presentation deck.*

**Projects.** Teams work on specific projects related to complex challenges of global import. Possible areas include climate change, diabetes, sustainability, global health, financial sector reforms, or non-profit management. Each project has an external partner.

Some projects may extend work from other classes. For instance, students could generate models or causal maps based on their G-Lab experience, along with a paper that contextualizes case specifics with a generalized problem statement and discussion. New Sector Alliance projects may also be considered.

**Course design.** *Project work:* Students work on their team projects throughout the semester, in parallel with classroom topics. We take a few weeks at the semester's start to explore proposals, then finalize projects as students form teams, agreeing on a specific plan with their external stakeholders. We help find these partners, if needed.

*Class topics:* The first topical area is a practical exploration of the system dynamics method for defining and scoping a problem-driven study, including its use in business and consulting worlds. To set the global context we then survey several foundational system dynamics studies of complex, large-scale issues. For the third portion of the course, we connect to the practical by looking at relevant organizations, exploring the practices and arrangements that enable firms, civil society, or governments to address global challenges. For instance, we apply system dynamics lenses to case studies of business models and internal change initiatives. Lively discussions with guest speakers focus on real-world applications.

**Course operations.** Students may pick from a portfolio of project possibilities or bring their own project forward. The criteria and process for students to submit projects will be available in mid-December. Not all projects are taken up, but we work with students to refine and match projects.

Every class session includes an interactive, project-related portion, devoted to peer assists, team work, or the practical application of frameworks and theories to projects.

Collaboration with partners in industry, academia, or elsewhere is a key part of the course, and many projects will have local partners. Highly-motivated teams or team members are encouraged to apply for outside-class grant and travel funding, if relevant. There is no final exam. Our once-a-week format means that teams are expected to work with external partners weekly, generating content and experiences to share in class sessions.

**Many MIT students benefit from international experiences and MIT's global connections. With 15.875, build on these opportunities to develop insight into a real problem in an applied project. It's a unique chance to combine a focused study with System Dynamics' rigorous, wide-reaching, and practical approach.**

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For updated information visit <https://wikis.mit.edu/confluence/display/sastry/15.875>