

## SDM Core Integrated Team Project

### OVERVIEW

The integrated team project is part of a nine-month core course on the foundations of systems architecture (SA), systems engineering (SE) and project management (PM). In these projects, teams dive deeply into the design and management of particular technologically enabled system. These Team Projects run for 4 months, from January to May.

**Industry, government, and organization sponsors are encouraged to prepare a challenge proposal, pitch, and support these projects.**

Not all proposals are selected. Students vote on their top 3 preferred challenges, from which teams of 4 to 5 students are formed – in 2020, 25 of 36 challenges were selected.

There is no fee for companies to pitch a challenge, nor if your project is selected by a student team for continued work.

### Types of Projects

**All challenge pitches must involve a system to be designed** by the students, that said, there is flexibility in the type of challenge and we will work with you to refine these. Options include:

- Bringing a promising new cutting-edge technology from the lab to market
- Enhancing an existing product by infusing one or more new technologies
- Investigating a particularly troubling or dysfunctional product and suggesting significant improvements
- A historical case study of a systems project that was particularly successful or unsuccessful and extracting lessons learned for the future

Projects should be non-trivial and involve a complex technical system with significant societal, technological, or programmatic challenge to be solved.

Consulting, organizational design, process improvement, and portfolio pruning projects are not available at this time.

### Expected Minimum Time Commitment

Each team will coordinate with MIT and Sponsor mentors for regular dialogue and guidance.

Students are expected to spend approximately half of their out of class time (5 hours each week per person) on team project activities.

Sponsors are expected to have one representative to pitch the challenge(s) remotely to the students during the 2<sup>nd</sup> week of January (exact date TBD) and participate in kick-off events.

**Sponsors are expected to spend a minimum of 24 hours supporting the project:**

- 4 hours preparation during the fall and challenge pitch in early January 2021
- 1 hour per week supporting students during the term (16 hours total)
- 4 hours to view final presentations, assessment and feedback (May 2021)

### Team Project -- Final Events (May 2021)

Each team will deliver a presentation that summarizes their results and recommendations. The final presentation from each team must exhibit the framing, design, analysis, and future recommendations for their system including architecture, systems engineering, and project management. A detailed schedule and evaluation criteria for the projects are shown below. Student teams may be invited to brief the sponsor at (or soon after) the course conclusion.

RECENT PROJECT SPONSORS



U.S. AIR FORCE



OBAYASHI



JOHN DEERE

BAE SYSTEMS



## General Guidance

### Guidance on Role of the Sponsor

The primary role of the sponsor is to **provide real-world context, review progress as requested by students, and advise on the relevance of the team's focus -- the "voice of the challenge."**

- Team projects are selected, managed, and ultimately delivered by the students themselves. The students have the prerogative to choose where to focus, how to evolve, and what to deliver. We ask that sponsors remain flexible as students explore, even if that diverges from the expectations of the sponsor.
- In a university, students may choose an unexpected path, fail, or simply do a mediocre job earning a lower grade. This academic liberty is important to promote motivated learning.
- The team projects are part of a course, and are not sponsored research. It is not appropriate to require a contract, specific deliverable or tool, nor to require any agreement (e.g. NDA).
- If data is core to the Project, the expectation is that the data to be supplied by the Sponsor is available and pre-packaged, available for student team use in a university course setting, on January 4, 2021.
- Overall, the experience of past sponsors has been very positive, with regular interaction with MIT students, a chance to see different ways of framing the challenge, and access to the latest techniques in SA, SE, and PM. The team project can stimulate follow-on internships, thesis work, and sponsored research with a deeper dive and research deliverables.

### General Guidance for Student Teams

Cover the context, system architecture, system engineering and program management aspects of a system, resulting in an in-depth analysis and executive level recommendation.

Explain the team's choice to select and apply certain SA, SE, or PM methods and tools.

Balance past experience with new thinking, methods and techniques introduced in the course.

- These may be different from approaches used in specific companies or industries, yet exploration of differentiated approaches is an expectation for this project.

### Student Team Coordination with Sponsors

Be sure very early to agree upon a regular coordination schedule and style with the sponsor. Please adapt the approach to reflect the busy schedule of both the sponsors and fellow students. A minimum bi-weekly communication is recommended, as well as 1 or 2 major reviews of intermediate progress during the semester.

- Group chats (slack, whatsapp, etc) which include the sponsor and team are a good idea, but tend to get abandoned as the project goes on and teammates want an internal channel
- Group folders (dropbox, google docs, etc) are also a decent idea, but like the chats, these get neglected as teams want privacy
- The sponsor usually enjoys providing feedback or reviewing, which can be in tension with students doing things at the last minute
- There may be tension between assignments and what the sponsor envisions or prioritizes.

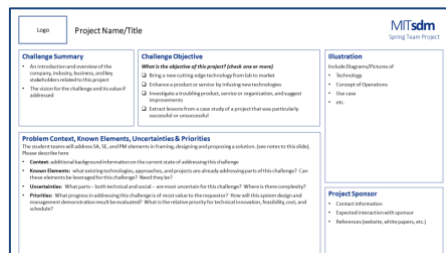
## Topic Submission Process

Industry, Government, and other organizations are encouraged to review this guide and prepare a draft challenge topic by **November 20, 2020**.

Submission should be mailed as a 1-page PowerPoint slide based on the provided template. These drafts should be mailed to [sdm-teamproject@mit.edu](mailto:sdm-teamproject@mit.edu)

SDM core instructors will provide feedback for refinement.

Students will be provided the list of candidate topics at the start of December, and access to the refined slides leading up to the Challenge Showcase event in early January.



## 2020-2021 Schedule

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| <p>Nov 20, 2020</p>                       | <p><b>Challenge Submissions</b></p> <ul style="list-style-type: none"> <li>• Candidate sponsors submit a <b>draft of their proposed</b> topics. MIT SDM core instructors provide feedback for refinement.</li> <li>• Students receive a list of topics in December, and access to 1-page summaries at the start of January.</li> </ul>  |
| <p>Jan 2021<br/>(2<sup>nd</sup> Week)</p> | <p><b>Challenge Showcase - January (exact date TBD)</b></p> <ul style="list-style-type: none"> <li>• Students present technology posters from technology scouting assignment, exhibiting emerging technologies from across MIT.</li> <li>• Proposals that have been submitted and refined are presented by sponsors in 5-min pitches at MIT. Students vote on their top 3 choices.</li> <li>• Project teams selected and kick-off begins</li> </ul> <p><b>Initial meetings</b> with sponsors and refinement of project challenges and definitions.<br/> <b>Daily workshops</b> for newly formed student teams.<br/> <b>Design Challenge 3:</b> Launch Teams, Frame Problem, and Establish Charter</p> |
| <p>Feb-May, 2021</p>                      | <p><b>Spring Term</b></p> <ul style="list-style-type: none"> <li>• Team project work ongoing through the semester</li> <li>• Meetings / check-ins with mentors once/week</li> <li>• Company feedback on team and process</li> </ul>   |
| <p>May 2021</p>                           | <p><b>Integrative Project Final Presentations – May (exact date TBD)</b></p> <ul style="list-style-type: none"> <li>• The format for final presentations will be fully determined at a later date pending MIT operational plans for the Spring 2021 term.</li> <li>• An <b>interactive poster session</b> may be held. This poster session will be open to the MIT community and project sponsors.</li> <li>• Presentations:             <ul style="list-style-type: none"> <li>○ Scheduled in advance; sponsors are welcome and encouraged to attend</li> <li>○ ~10 minutes + QA for each team</li> </ul> </li> </ul>  |