

# Fall 2020 Teaching Scenarios Summary

## Questions Asked

- Scenario 1: Fully Remote
  - Please give us a sense of your plans if MIT is fully remote
  - How can we help you?
  - Are there opportunities to reduce the number of subjects taught without disrupting student fulfillment of requirements? (Please tell us if your answer to this question differs for subsequent scenarios from your answer here.)
  - What components of your current learning objectives CANNOT be achieved remotely?
- Scenario 2: Hybrid
  - Please give us a sense of your plans if only some students are remote (e.g. international students)
  - How can we help you?
  - What are the practical requirements of teaching this way?
  - What are the potential impediments?
- Scenario 3: Socially Distant On-Campus
  - How would you operate if there is strict social distancing (required minimum square feet per person) for lab/project/studio/performance spaces?
  - How can we help you?
  - What are the practical requirements of teaching this way?
  - What are the potential impediments?
- Scenario 3.5: Half of the Undergrads for Half of the Time
  - How might you suggest that MIT divide the students? (e.g. by major, year, student choice to coordinate with friends)
  - How would you operate the non-remote-able components of your curriculum in these circumstances?
  - What are the practical requirements of teaching this way?
  - What are the potential impediments?
- Scenario 3.75: Three Semesters
  - Do you have feedback on options for which students to have on-campus when?
  - How would you operate the non-remote-able components of your curriculum in these circumstances?
  - What are the impacts on students, faculty, and staff?
- Moving from "Managing" to "Thriving"
  - What are some department/program specific learning opportunities that would be unique at this time?
  - What are some broader and potentially MIT-wide learning opportunities?
  - Feel free to share any other thoughts.

# Common Themes

## Preferred Scenarios

- Many departments seemed to treat Scenarios 2 and 3 less as distinct and more as a continuum. Presuming most (but not all due to health risks and/or visa issues) students live on or near campus, they have varying strategies for hybrid teaching. In general this seemed like the best option to most, given that it allows certain lab and project classes to run hands-on classwork.
- A fully remote option was generally regarded as doable but less than ideal.
- The trimester option was widely rejected. Reasons included impacts on IAP and summer activities (required or beloved), worries about teaching load, worries about condensing course material into shorter terms, and moving/lease concerns for students.
- The 50-50 option (3.5) was considered better than 3.75 by most, but some worried about impacts on making students move out midway through the term. Departments gave mixed responses on their ability to condense the hands-on portions of classes into half of the term.

## Values / Philosophy

- Health and safety as first priority
- Equity and access are crucial
- Social interaction/community
- Ensuring departmental “culture” is maintained
- The residential experience is an essential, if not inextricable, part of an MIT education
- On-campus learning has far more to do with interactions outside of the classroom than inside of it

## Strategies

- Thinking small (physically and in terms of offerings)
  - Smaller sections for lab classes
  - Use small recitation-style rooms for lecture video capture and larger lecture spaces for socially distanced discussions/recitations
  - Reduce number of electives offered
- Rethinking teaching spaces
  - Use event spaces for class teaching to promote social distancing (no large events)
  - Teach outside or under tents

- Building partnerships
  - Consider partnerships (academic and administrative) with peer institutions and other relevant entities.
  
- Mixed mode teaching
  - Recording synchronous lectures and posting to be accessed asynchronously
  - Offer different classes to remote and in-person students with more emphasis on individual coaching and guest speakers for remote students
  - If some students are remote, design the online version first and then adapt for in-person
  - Build structured peer relationships between in-person and remote students
  - Increase the flexibility of programs to accommodate more independent studies
  - Designate some classes residential only and some residential + remote
  
- Rethinking Labs
  - Teaching staff record experiments in labs, students analyze data remotely
  - Redesign project/lab class curricula to have the hands-on work concentrated in one half of the term (Scenario 3.5)
  - Send kits (cheap supplies, low-voltage electronics, etc.) to students
  - Increased emphasis on coding and simulations
  - Move lab classes to spring term (potentially cutting some content to account for increased use of labs)

## Needs/Wants

- Technology
  - Better video equipment and editing capabilities and video capture in classrooms (strong interest in this)
  - A centralized system of virtual lounges or similar peer workspaces
  - Remote access to Bloomberg terminals (Sloan)
  
- Training/Coordination
  - Faculty training for online tools and pedagogy
  - Forum for cross-departmental coordination to ensure that cross-disciplinary requirements are offered
  
- Policy
  - Find ways to offer UROPs to graduating seniors
  - Find ways to allow group work on psets while socially distancing, clear and enforceable policies for social distancing in academic lounges, labs, etc.
  - Different grading policies/expectations for remote students if some students are in-person and others are remote

- Procedures for finding remote RAships for incoming students or tuition support for these students
- Clear back-up plans if, for example, an instructor fails a temperature check on their way to teach a class (and similar scenarios)
- Flexibility on class time restrictions to allow recitation times in different time zones and/or more lab times for in-person classes
- Financial (to support faculty, TAs, etc.)
  - Financial and visa support for international students, particularly first-year grad students
  - Funding for remote guest speakers
  - Funding to send necessary lab equipment to student homes
  - Additional TA support to enable smaller recitations
  - Funding for more staffed hours in labs and machine shops and more frequent cleaning
  - For terminal master's programs with an RA funding model and with a large % of incoming international students, student support is a major issue, as it will have immediate and longer-term consequences on the health of the program, its ability to attract future students, etc.
  - Free out of state mental health treatment for remote students

## How to Split Up Students If Needed

- By year (class)
- Incoming students in first term to build cohort
- PhD students coordinate with PIs to pick least disruptive time
- Prioritize students really struggling with learning at home
- Allow students to pick times based on friends/living groups
- By course

## Can't Do Remotely

- Most hands-on projects and experiments - anything requiring machine shops, wet labs, A/V production facilities, etc.
- Some aspects of group work
- High-quality cohort-building (particularly across time zones)

## Unique Ideas / Insights

*Note: Many departments expressed interest in teaching courses related to Covid-19. It is not clear how many courses would be desirable / possible (or of interest to students). It might be best to have a sub-team think through developing a few, broader, "Designing Your First Year"*

*level courses that are open to the entire student body. Some of these should be Covid-related and some should function as a “distraction from Covid” which was noted as desirable by some students.*

- Anthropology (Undergraduate)
  - Anthropology subjects have the potential to take real advantage of having students located throughout the country and around the world. Students can pursue “real world” investigations of concepts or issues discussed in class readings and lectures. We can “bring the world” into the classroom by asking students to report from their home cities, states and countries.
  
- ChemE
  - Prof. Chris Love offers a course on design of immunotherapeutics that is extremely well-suited for emphasis at this time.
  - We are also thinking of plans to leverage the BioMaker Space and other curricular elements to offer unique seminar series or courses that may be offered to our students in the age of COVID.
  - If students are not able to return to campus, it may be possible to use local MIT Clubs to help catalyze connections between students in remote locations.
  
- CMS/W (Undergraduate and Master’s)
  - Some new classes that take advantage of the medium. There are ideas for new science fiction classes, COVID related classes, classes about and in virtual worlds, and classes that connect to other classes to create larger learning communities.
  
- D-Lab
  - D-Lab staff are interested in offering “bite-size” virtual learning modules that could teach students maker skills or other skills at home. This would be a way of exposing more students to D-Lab’s work in an accessible and fun way, while giving them an opportunity to learn or improve maker skills in an environment where they may not be able to do so easily.
  - One could also imagine working with students to develop COVID-19-themed projects of relevance to the needs of global development.
  
- EAPS (Undergraduate and Doctoral)
  - EAPS has generated some special online classes and class modules related to fieldwork, climate, and Earth history that might appeal to a wide swath of the MIT community, especially with most of us cooped up at home and unable to travel:
    - A virtual field trip to NY and MA to study how plate tectonics assembled Massachusetts
    - from 12.001: Introduction to Geology (Prof. Oliver Jagoutz).
    - MITx class: 12.DTE (Deform the Earth), A virtual rock deformation lab (Prof. Matej Pec).
    - MITx class: 12.12 Nature’s Sandbox: A History of Earth’s Environment, Life and Climate (Prof. Kristin Bergmann).
    - MITx class: 12.340x Global Warming Science

- Experimental Study Group (Undergraduate only / First-Year only)
  - Maintaining a “cohort” will be essential, as ESG offers community-based learning.
- Global Languages (Undergraduate only)
  - We can offer global, diverse, multilingual perspectives on the pandemic and its social/cultural impacts
- Integrated Design and Management
  - Teaching the use of human-centered design across disciplines. IDM might open our online lectures to other students to broaden their understanding of human-centered design.
- MAS (Grad Program)
  - Adapt MAS.863, the Media Lab’s “How to Make Almost Anything” course to an online format. This would also allow us to increase enrollment (the course is always over-subscribed) and potentially offer an open online version as well.
  - Create a special subjects MAS course focused on designing new models for blended and online learning - using COVID as the immediate challenge, but looking much further ahead to new ways of supporting collaboration, knowledge generation, and learning in a particularly ML/MAS style.
  - Grad version of the UROP program to offer short-term research experiences outside of their home lab (particularly if home lab not conducive to remote work)
  - MAS could research higher-quality online interaction software (i.e. Zoom with better A/V)
- Music and Theater Arts (undergrad)
  - This is an opportunity to explore emergent and contemporary technology in theater performance. Other universities lack the student population who can implement technological ideas; MIT is rich in this domain. We are planning on a “production” this fall that is totally online, something that only MIT can do.
- MIT-WHO
  - Expanding the MIT global reach. It would be pretty amazing for the MIT community to be working across **the world, not just in research, but in many aspects of our administration.**
- Philosophy (Undergraduate and Doctoral)
  - Remote teaching makes it easier to have philosophers around the country and the world visit our “classrooms.” We might also hold joint events with philosophy students from other institutions.
- Physics (Recommendations from students):
  - Offering some compressed and accelerated half-semester courses might encourage students to interact more with peers and faculty, and provide a focal point of sorts during the semester.

- If the fall ends up being fully remote, MIT as an institution should actively encourage remote research and internship opportunities **by reaching out to faculty and the alumni network.**
- Physical Education and Wellness
  - I appreciate the coaching model set up with 600 volunteers – there seems to be a pent-up desire to help students. It might be worth considering maintaining the model of volunteer life coaches to supplement first year and academic advisors.
  - Remote teaching may allow for easier collaboration because there are “no walls” – Emma Teng proposed a Buddhism course that is paired with a meditation course offered through Physical Education and Wellness that may be easier logistically to accomplish together remotely.
  - The creation of an MIT app could be valuable to track activity, nutrition, sleep, provide meditation, and of course infection to tether students, staff and faculty to the MIT campus.
- Political Science (Undergraduate and Doctoral)
  - Some faculty and staff believe that we are well positioned to provide excellent online classes, and we should capitalize on our successes to draw in more students. And some are thinking about inviting special guests more often to online classes, given the ease of doing so (no transportation costs!).
- Biological Engineering
  - We could provide electronics hands-on exercises by enabling students to use low voltage USB all-in-one waveform generator / oscilloscope / network analyzer devices. We propose to mail each student individually one such apparatus, together with other small electronic components, so they can learn practically the signals & systems segment of the course (\$350 per student, ~35 students total). The devices would be collected back from students and be reused semester after semester (even well after the pandemic has ended).
  - To thrive rather than manage in our wet lab classes, we are now investigating the use of remote cloud labs, namely Strateos and Emerald Clouds. In principle, these can support DNA assembly and cell culture (including observations, e.g. microscopy and FACS). With these capabilities, we could potentially offer a truly futuristic version of wet lab classes in the area of synthetic biology. Setting up a framework for remote lab experiments is something that we have been interested in investigating for several years. In the Weiss lab, they already have some experience with liquid handling automation, and are in a good position to invest in this effort. However, it will require a real effort and funding would be necessary
- EECS
  - Collaborative teaching with faculty at other universities is an opportunity – remote teaching means that it's potentially as easy to co-teach with somebody at Berkeley as it is to co-teach with a colleague down the hall, which can allow refreshing parts of our curriculum with new ideas and new approaches from beyond MIT. We are already exploring this possibility for 6.875, a graduate-level cryptography course that typically enrolls 70-80 students.