Academic and Residential Life: Challenges and Responses to COVID-19

Cynthia Barnhart, Chancellor May 2020

Life at MIT, Fall 2020

Some Facts

- Campus academic capacity reduced (maximum of ~4000- student capacity at any time, maximum lecture room 50-70 people)
 - A significant percent of subjects taught on-line
 - Campus access will be restricted to certain students at certain times for certain locations



Practice physical distancing (6 feet apart) inside and outside



Quarantine for 14 days upon entering state



Require face covering



Handwashing or sanitizing hands made available throughout campus



Increased cleaning and sanitation



Required testing, tracing and treatment protocols for being on campus

Adapting the MIT campus footprint for campus-based learning in Fall 2020



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Some Facts

- Campus academic capacity reduced (maximum of ~4000- student capacity at any time, maximum lecture room 50-70 people)
 - A significant percent of subjects taught on-line
 - Campus access will be restricted to certain students at certain times for certain locations
- Reduced graduate and undergraduate residence hall capacities
 - Maximum capacity of residences and FSILGs in fall at about 50% of the UG student population
 - Will increase when construction of new residence halls complete, expected end of year 2020
 - 85% of graduate student housing capacity available



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2020 Fall Residential Capacity



~4500 registered undergraduates per semester Shortage of ~1800 beds in the fall

Ways to close the ~1800-bed gap

- 1. Rent hotels or apartments
 - Potential for 1000 beds in nearby and local hotels
- 2. Relax or transform density rules (pods, fixtures, etc.)
 - Reduces isolation, disease spread implications
- 3. Suspend on-campus housing guarantee for upper-level students
 - Responsibility to greater Boston community?
- 4. 2-Semester Model: Limit students to one semester oncampus and one-semester remote (no access to campus)
- 5. 3-Semester Model: Spread two semesters of subject offerings over three semesters
 - Increases residential and academic capacity by 50%
 - Maintains on-campus access for two semesters for each student

2020 Fall Residential Capacity



3-Semester Model (S1, S2, S3)

~2250 registered UGs in S1 [25% UGs registered in Semester 1 (S1) **and** Semester (S2); 25% UGs registered in S1 **and** Semester 3 (S3); 50% UGs registered in S2 **and** S3] Bed shortage = 0

Matching the number of registered students on campus with the number of available beds in MIT housing

- ~50% of students in semester 1 (S1)
- Adjust the number of students registered in winter and spring semesters to reflect changes to available capacity
 - Likely scenario: 75% of undergraduates registered in Semester 2 (S2) and in semester 3 (S3)
 - New residence halls on-line by end of December 2020
 - Relaxed social-distancing protocols for students with known
 immunity
 - Optimistic scenario: 100% of undergraduates registered in Semester 2 (S2) and 50% in Semester 3 (S3)
 - Availability of treatments (therapeutics, vaccines)

The 3-Semester Model: Optimizing the Educational and Residential Experience

3-Semester Model:

- Decide for each subject offering, which one semester it will be offered
- Decide for each student, which two semesters the student is **on-campus** (and which one semester the student is remote)

Some possible implementations :

- 1. INDIVIDUALS:
 - Decide which subset of individual students is on-campus together (and which is remote)
- 2. MAJOR-CLASS YEAR:
 - Decide which grouping of students by program-year (e.g., thirdyear 6-3 (primary) majors) is on-campus together (and which is remote). All first-years are a program-year cohort.
- 3. CLASS YEAR:
 - Decide which grouping of students by class year (1st-, 2nd-, 3rd-, and 4th-years), and which is remote.



4th-years on-campus in semesters 2 and 3 (remote semester 1)

Optimization Results

Data 2020FA and 2020SP

- 4,278 students
- 588 subjects in 720 offerings
- 5.2 required subjects per student ("common major subjects" + GIRs + lab/design/project/performance subjects)

Results

- Number of subjects taught in fall (with smaller differences for other semesters)
 - 369 taught in 2-semester fall
 - 124-213 taught in the 3-semester fall
- Percent of subjects commonly taken in a major or requiring on-campus presence that are taught when the student is oncampus
 - 51-59% for 2-semester model
 - 92-96% for 3-semester model
- Number of subjects that have the potential for components (or all of the subject) to be taught fully in-person
 - 108-168 in the 2-semester model
 - 501-518 in the 3-semester model

Number of Semesters	Student Assignment Approach	'Required' Subjects Taught while Student is On-Campus	Number of Subjects Taught FA/S1	Offerings with > 95+% Enrollment on Campus (out of 720 offerings)
2	Individuals	59%	369	108 offerings
2	Major- class year FA 1-2 / SP 3-4	57%	369	168 offerings
2	Class Year	51%	369	163 offerings
3	Individuals	96%	191	501 offerings
3	Major- class year	96%	213	518 offerings
3	Class year S1 1-2 / S2 2-3-4 / S3 1-3-4	92%	124	511 offerings

Significant contributions in generating optimization results thanks to: **Dr. Julia Yan** and **PhD student Arthur Delarue**, and **Professor Dimitris Bertsimas** (Operations Research Center, MIT)

Scheduling Opportunities

2-Semester Model

- 1. Begin fall semester start of September and end instruction before Thanksgiving
 - Eliminate need for travel at Thanksgiving **and** end of Semester
 - Safeguards 'second-wave'
 - Begin classes 1-week early
 - Reduce the length of the semester by 1week to end instruction before Thanksgiving
 - Move final exams on-line, beginning the week after Thanksgiving
- 2. Start fall semester as late as January
 - If known by late summer that a vaccine will be available by end of fall
 - Elimination of IAP

3-Semester Model

- 1. Compress 3-semesters to begin start of Sept and end third week in June
 - Reduce the length of each semester by 1-week
 - End S1 instruction before Thanksgiving
 - Start S2 with 2-weeks of on-line instruction in December
 - Eliminates need for students to travel in December
 - Eliminate IAP
 - 2-week break for December holidays, 1week break at end of March

2-Semester Model vs. 3-Semester Model

2-Semester Model

- For an undergraduate student registered for 2-semesters
 - 1-semester on-campus, 1-semester remote
 - Unless hotel capacity purchased
 - Almost all subjects taught on-line
 - 'Tried and true' academic schedule

3-Semester Model

- For an undergraduate student registered for 2semesters
 - 2-semesters on-campus, 1-semester remote
 - Maximizes number of labs, design, project, performance, small-group discussion subjects or components of subjects to be offered in-person
 - 'Bonus' semester allows speed-up to degree completion
 - Added schedule complexity and extended academic year calendar, may require additional support for instruction and administrative staff roles.

Impacts

- Safety
- Quality of educational and social experience
- Mental health and wellbeing
- Numbers of students deferring or taking leaves
- Pricing