MIT Classroom Capacity & Flow in COVID-19 Era

May 2020

Rafi Segal (SA+P), Chris Caplice (SoE CTL), Joe Higgins, Jennifer Marshall, Peter Cummings, Greg Raposa, Krystyn Van Vliet
With daily input/edit from full Space Contingency Working Group

8AM Update: May the 4th
Principles

1. Deliver educational excellence for students
2. If a class component can be done well on zoom/canvas, it must be done remotely (off-campus)
3. On-campus class time may be a *subset* of a given subject number (not meeting together on campus MWF 9-10am because that was the normal schedule in Fall 2019)
4. Minimize schedule implications, but realize these are nonzero
5. Faculty and staff health just as important as student health; included in both campus travel and space cleaning considerations
6. Minimize mixing of people during a given day (campus sectors)
7. Plans capable of ramp up *and* ramp down over time
How can/should MIT teach on-campus in Fall 2020?

1. **Physical On-Campus Teaching Capacity (CC)**
   - Inventory of current and novel teaching spaces
   - Estimate student capacity and learning conditions

2. **Student / Instructor Flow Strategies (RS)**
   - How students enter, move within, and exit campus
   - Scheduling, sequencing, re-structuring on-campus components of classes

3. **Overall Teaching Strategies (All)**
   - What classes must be in-person (IP) and what can be online (OL)
   - Using on-campus facilities to improve educational mission

Covered in 8AM call, 04 May 2020
Classroom Capacity in Normal Times

Legend
- Classrooms: 250
- Teaching Labs: 90
- Studios / Music Practice: 50
- Athletic Areas / Gyms: 9
- Assembly / Multi-purpose: 6
- Library / Study: 4
- Exhibition Space: 3

Total Spaces: 412

Number of Spaces

Class Size
- < 5
- 5 - 10
- 11 - 20
- 21 - 40
- 41 - 70
- > 70

Student Capacity
- 100 SF per Student
- 75% occupancy

- < 5: 200
- 5 - 10: 1,000
- 11 - 20: 700
- 21 - 40: 800
- 41 - 70: 500
- > 70: 1,100
1. Physical On-Campus Teaching Capacity

- Initial capacity estimates
  - Divide area by safe distance per student (160 sf/)
  - Assume circle of safety (6 ft diameter or ~ 30 sf/student)

- All Rooms are not created equal
  - Five (really just 4) Room Types
    - Modern Tablet Armchairs e.g., 1-135 (40) Easier & more flexible usage
    - Modern Tables & Chairs e.g., 1-132 (77)
    - Fixed Modern Tables & Chairs e.g., 1-115 (26) Hard & inflexible usage
    - Fixed Modern Tablet Armchairs e.g., 1-190 (18)
    - Fixed Wooden Tablet Armchairs 54-100 (1)

- How does the social distancing layout differ by room type?
Type 5: Fixed Modern Tablet Armchairs
Fixed Modern Tables & Chairs

1-115

E51-315

E51-372

26-152
6-120

- Capacity: 143
- Area (sq. ft.): 1467
- Furniture Type: Fixed Modern Tablet Armchairs

9.1 students @ 160 SF spacing
= 27 students.
(~54 sf/student)

Mitchell Galanek & team on May 1, 2020:
137 seats w/ 6’ separation
~54 sf/student
1. Physical On-Campus Teaching Capacity

• Weekend and Today
  1. Calibrate capacity of rooms of different types
  2. Add more non-traditional teaching spaces (Samberg, meeting rooms, etc.)
  3. Develop initial portfolio of spaces by capacity and potential usage
  4. Guidelines for cleaning between use in given day (wipe in, wipe out)
HYBRID TEACHING MODEL

ONLINE + IN-PERSON
Be clear on why we teach and meet in-person, on-campus

• Select classes or parts of classes that significantly benefit from in-person teaching (on departmental level)
• Understand restrictions: spatial distancing and other conditions in ‘COVID state’ in-person class (classes would need to adapt)

→ Reduce demands for physical space
working towards:

**DISPERSED, LOW-DENSE CONDITION OF SPATIAL DISTANCING**

How to avoid crowding & minimize interaction?
In class (place) and in movement (flow)
(breaking down our community into smaller ‘controlled’ units)
DESIGNATED SPACES + ENTRANCES
FOR THE SAME GROUP OF PEOPLE & LIMITED IN NUMBER
- Designated entrance for each campus-goer located closest to designated in-person learning space
- Once in the in-person learning space - minimize flow within campus
- Groups/cohorts stay in same space ~ ½ day max. & leave campus
- Designated times (days of the week)
CAMPUS AS A PATCHWORK OF SEPARATE DISCONNECTED UNITS...
Not a good model for vibrant on-campus teaching in sectors, when campus space access will be constrained
MIT Campus Map

Welcome to MIT

All MIT buildings are designated by numbers. Under this numbering system, a single room number serves to completely identify any location on the campus. In a typical room number, such as 7-121, the figure(s) preceding the hyphen gives the building number, the first number following the hyphen, the floor, and the last two numbers, the room.

Please refer to the building index on the reverse side of this map, if the room number is unknown.

DRAFT
- Not adapted for Fall 2020 teaching
- Not yet optimized for any use
- Not including DAPER or residential overlays
2. Student / Instructor Flow Strategies (Rafi Segal, lead)

• This weekend and today
  • How students enter, move within, and exit campus
  • Minimizing student movement within campus
  • Scheduling, sequencing, and re-structuring of physical classes
  • Students sit in place and instructors rotate?
  • Students in AM or PM
  • Single entry/exit per day at designated points