Academics at MIT
2019 Orientation

Ian A. Waitz
Vice Chancellor

Kate Weishaar ’18
First-Year Experience Coordinator
Agenda for today

1. Core curriculum (GIRs)
2. Experimental grading and credit limits
3. Some advice: Explore, get calibrated, ask for help
4. Q & A with Tanner, Pooja, & Daniel
General Institute Requirements

Humanities, Arts, & Social Sciences (8 subjects)  
Communications (4 subjects)  
Science core (6 subjects)  
Lab (1 subject)  
Restricted Electives in Sci & Tech (2 subjects)  
Physical Education (8 points + swim test)

http://catalog.mit.edu/mit/undergraduate-education/general-institute-requirements/
Quick poll

How many of you came to MIT for its exceptional educational opportunities in the humanities, arts, and social sciences?

One of the most important things you will learn to do at MIT is to think in **MULTIPLE DIMENSIONS** about very complex problems.
Humanities, Arts, and Social Sciences (HASS) requirement

- Distribution (3 subjects)
  - Humanities
  - Arts
  - Social Sciences

- Concentration (3-4 subjects)
  - Conc. Subject 1
  - Conc. Subject 1
  - Conc. Subject 1
  - (Conc. Subject 4)

- Elective (1-2 subjects)
  - Elective 1
  - (Elective 2)

Total: 8 subjects
In the Arts, you can take a Music & Technology class with new media pioneer Eran Egozy…

“Technology and humanity are now deeply interlinked.”

ERAN EGOZY ‘95, CO-FOUNDER OF HARMONIX
and create works in MIT’s new theater building with award-winning directors and designers.
In the Social Sciences you can discover how to use economics to alleviate global poverty (14.73)…
and learn how to help safeguard democracy in a Political Science class on data and politics.

MIT ranked No.2 worldwide for Social Sciences

Times Higher Education, World University Rankings, 2017-18
In the Humanities, you can delve into the ethics of climate issues in a philosophy class (24.07)…
explore how gender, race, abilities and other aspects of identity affect your world...
and prepare for a successful MISTI internship pretty much anywhere in the world.

Students call the MISTI experience transformative
Or explore just about anything through MIT HASS classes like:

- People and Other Animals
- Africa for Engineers
- Justice
- The Meaning of Life
- Cultures of Computing
- How to Construct a Language
- Science Writing
- Science Fiction & Fantasy
- Interactive Music Systems
## Distinguish Yourself

Based on what you know now, how well do you think your undergrad experience at MIT prepared you to...

<table>
<thead>
<tr>
<th>Skill</th>
<th>Very Poorly</th>
<th>Less than Adequately</th>
<th>Adequately</th>
<th>More than Adequately</th>
<th>Very Well</th>
</tr>
</thead>
<tbody>
<tr>
<td>Think analytically &amp; logically</td>
<td>6%</td>
<td>11%</td>
<td>81%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use quantitative tools</td>
<td>12%</td>
<td>21%</td>
<td>64%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Write clearly &amp; effectively</td>
<td>8%</td>
<td>42%</td>
<td>27%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Communicate well orally</td>
<td>13%</td>
<td>42%</td>
<td>28%</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>Be an effective leader</td>
<td>5%</td>
<td>12%</td>
<td>40%</td>
<td>25%</td>
<td>18%</td>
</tr>
<tr>
<td>Identify moral &amp; ethical issues</td>
<td>5%</td>
<td>16%</td>
<td>38%</td>
<td>28%</td>
<td>14%</td>
</tr>
</tbody>
</table>

Data from 2017 Alumni Survey (Class of 2006)

Some response items omitted for brevity
Communication requirement

A critical tool for sharing your ideas with the world and making an impact!

Many HASS classes fulfill the requirement

1 per year = 4 total

2 in HASS (CI-H) fulfill part of the HASS GIRs
2 in major (CI-M) fulfill part of the major reqs
Physical Education requirement

4 classes and the swim test

Don’t leave it until the end!

ICYMI: Pirate Certificate fulfills requirement
Physics 1 (Course 8)
Math 1 (Course 18)
Chemistry (Course 5 or 3.091)
Biology (Course 7)

Physics 2 (Course 8)
Math 2 (Course 18)

The Science Core
Physics

Students with less preparation

8.01L  Same material as 8.01 with more gradual learning curve

8.01  Standard version in Technology

8.012  More in-depth, harder problems

8.02  Integral formulation in TEAL format

8.022  Differential and integral formulation

Students with more preparation

Classical Mechanics

Electricity & Magnetism
Math diagnostic

The Math Diagnostic for Physics (8.01) and Math (18.01) Placement is a diagnostic tool that evaluates your high school math preparation.

Three scores determined from distribution:

**Low:** If below this, 8.01L is strongly recommended.

**High:** If above this, 8.012 is allowed.

**Very High:** Above this, 8.012 is recommended.

Also determines if students with a 5 in AP Calc BC may receive credit for 18.01.
Math diagnostic exam:
Correlation with Phys1 performance

<table>
<thead>
<tr>
<th>Probability of not passing, or dropping out of, 8.01 for scores in indicted range</th>
<th>MDE Score</th>
<th>Averages for students passing and not passing different versions of freshman physics</th>
</tr>
</thead>
<tbody>
<tr>
<td>2%</td>
<td>100</td>
<td>&lt; 8.012, PASS &gt;</td>
</tr>
<tr>
<td>10%</td>
<td>80</td>
<td>&lt; 8.012, DNP OR LEFT &gt;</td>
</tr>
<tr>
<td>17%</td>
<td>70</td>
<td>&lt; 8.01, PASS &gt;</td>
</tr>
<tr>
<td>36%</td>
<td>60</td>
<td>&lt; 8.01, DNP OR LEFT &gt;</td>
</tr>
<tr>
<td>52%</td>
<td>50</td>
<td>&lt; 8.01L, PASS &gt;</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>&lt; 8.01L, DNP OR LEFT &gt;</td>
</tr>
</tbody>
</table>
Math

18.01: Single-variable calculus

18.02: Multi-variable calculus

Intermediate Option: 18.01A + 18.02A

- 18.01A: 6-week review of single-variable calculus
  Focus on material not covered in Calc AB
  Finishes in middle of fall term

- 18.02A: Normal speed 18.02, runs through IAP

- Entry requirement for 18.01A:
  5 on A/B portion of AP exam
  or pass first half of 18.01 ASE during Orientation

Note: Take 18.02 early if interested in pursuing an engineering major.
Chemistry

Three subject options

5.111 Principles of Chemical Science
5.112 Principles of Chemical Science
3.091 Introduction to Solid State Chemistry

All cover material beyond AP chem (see link in guide!)

Chemistry ASE is offered during Orientation for students with an extensive chemistry background

Note: Take early if interested in pursuing a chemistry or life sciences-related major.
Biology

Fall 2019 Subject Options:
• 7.012: Genomics, cancer
• 7.015: Small course (<60), module-based learning focused on specific topics of interest

Spring 2020 Subject Options:
• 7.013: Human disease, development
• 7.014: Ecology, biosphere

Note: Take early if interested in pursuing a life science major.
Agenda for today

✓ Core curriculum (GIRs)

2. Experimental grading and credit limits

3. Some advice:
   Explore, get calibrated, ask for help

4. Q & A with Tanner, Pooja, & Daniel
Building Blocks of Change

1. Communication + engagement
2. A clear understanding of the needs
3. Good ideas rigorously evaluated

In true MIT fashion, we created a design class to take on these goals: Designing the First Year at MIT

Offered Spring 2018 (and fun-sized version in IAP 2019)
Key needs identified by our community

More support for exploration & choosing a major

Advising, advising, advising (vital in the first year and beyond)

Feeling inspired by a topic / love of learning

More flexibility to enable above
A new “Typical Schedule”

Science Core
Science Core
Science Core
CI-H/other HASS
Advising Seminar

Science Core
Science Core
Exploration
HASS Exploration
Advising Seminar/First-Year Discovery
Experimental grading policy

Up to 3 science core GIRs P/NR after the first semester

Designate P/NR or grades by add date

Once you designate a subject, you can retake it without using up another P/NR.

Note: This does not apply to NRs from first semester or A/B/C/NR. If you want to retake one of these classes on P/NR, you must use one of your 3 slots.
Benefits

Less pressure to take harder GIRs in fall
GIRs can still be P/NR later, so why not use the
fall to explore and ease yourself into MIT?

GIRs that won’t bring down your GPA
Focus on learning instead of stressing about
grades.

Freedom to challenge yourself
Prepared to take advanced versions like
5.112 or 8.022 but worried about your grades?
Now you can take the chance!
Keep in mind

Many majors have GIRs as pre-requisites
Check out roadmaps for majors you’re considering; take GIRs you need early.

Take 2+ classes on grades in FY spring
Sophomore coursework is often much harder, and you want to be prepared for full grades.

Not all major classes are suitable
We compiled a list of classes that are. If you go off-list, know that professors can and will enforce pre-reqs.
# Experimental credit limit: Fall

<table>
<thead>
<tr>
<th>Old system - Fall 2018</th>
<th>Your class - Fall 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units (Typical use)</td>
<td>Units (Typical use)</td>
</tr>
<tr>
<td>Credit limit = 54</td>
<td>Credit limit = 48</td>
</tr>
<tr>
<td>12 (GIR)</td>
<td>12 (GIR)</td>
</tr>
<tr>
<td>12 (GIR)</td>
<td>12 (GIR)</td>
</tr>
<tr>
<td>12 (GIR/Elective)</td>
<td>12 (GIR/Elective)</td>
</tr>
<tr>
<td>12 (HASS)</td>
<td>12 (HASS)</td>
</tr>
<tr>
<td>6 (FAS/Elective)</td>
<td>+9</td>
</tr>
<tr>
<td></td>
<td>$\leq 9$ (Discovery)</td>
</tr>
</tbody>
</table>

9 units of “discovery-focused subjects and approved exceptions”
“Discovery-focused subjects and approved exceptions”

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First-Year Discovery Subjects (FYDs)</strong></td>
<td>6-unit half-term subjects (e.g. 6.0001)</td>
</tr>
<tr>
<td><strong>Advising Seminars (FAS)</strong></td>
<td>Non-FAS seminars</td>
</tr>
<tr>
<td>UROP for credit (up to 6 units/semester)</td>
<td>&gt;6 units of UROP per semester</td>
</tr>
<tr>
<td>21M.4xx, Seminar XL, 12.000 (Terrascope)</td>
<td>9-unit subjects other than 12.000</td>
</tr>
</tbody>
</table>
First-Year Discovery Subjects (FYDs)

1-3 units
Little or no homework
Designed to help you discover majors, minors, HASS concentrations, and more
Listed at bit.ly/discovermit
FYDs: Fall 2019  bit.ly/discovermit

1.008 Solving Big Engineering Problems
1.009 Climate Change
4.001 Where is & What is Architecture & Design
10.000 Engineering Molecular Marvels: Careers & ChemE at MIT
11.s198 T.H.R.I.V.E.: Living Your Best Life at MIT
14.009 Economics & Society's Toughest Problems
15.000 Explorations in Management
24.93 The Search for Meaning
SP.245 The Sum of all Courses*
SP.246 The Future: Global Challenges & Questions*
SP.250 Transforming Good Intentions into Good Outcomes
SP.251 How to Change the World: Experiences from Social Entrepreneurs
SP.252 Careers in Medicine
### Experimental Credit Limit: Spring

#### Old system - Spring 2019

<table>
<thead>
<tr>
<th>Units (Typical use)</th>
<th>Credit limit = 57</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 (GIR)</td>
<td></td>
</tr>
<tr>
<td>12 (GIR)</td>
<td></td>
</tr>
<tr>
<td>12 (GIR/Elective)</td>
<td></td>
</tr>
<tr>
<td>12 (HASS)</td>
<td></td>
</tr>
<tr>
<td>9 (Elective)</td>
<td></td>
</tr>
</tbody>
</table>

#### Your class - Spring 2020

<table>
<thead>
<tr>
<th>Units (Typical use)</th>
<th>Credit limit = 60</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 (GIR)</td>
<td></td>
</tr>
<tr>
<td>12 (GIR)</td>
<td></td>
</tr>
<tr>
<td>12 (GIR/Elective)</td>
<td></td>
</tr>
<tr>
<td>12 (HASS)</td>
<td></td>
</tr>
<tr>
<td>12 (Elective) [optional 5th class]</td>
<td></td>
</tr>
<tr>
<td>≤ 9 (Discovery)</td>
<td></td>
</tr>
</tbody>
</table>

More flexibility in the spring, but we still recommend 48 units (plus up to 9 discovery)
Note:
No Early Sophomore Standing
No credit limit petitions
Agenda for today

- Core curriculum (GIRs)
- Experimental grading and credit limits

3. Some advice: Explore, get calibrated, ask for help

4. Q & A with Tanner, Pooja, & Daniel
Why explore? Because...

9% of you are unsure of your major...

and only 50% are confident that your current choice will be the right major for you.

84% say that you are open to having your mind changed about your planned major.
and...

99% of you are interested in exploring more deeply a major that you are considering.

88% of you are interested in exploring more deeply academic majors that you have not previously considered but sound interesting.

Data from Survey of New Students 2019
and future you knows best...

within 5 years of graduating, 75% of MIT undergrad alums are working in a field not directly related to the major they studied at MIT!
...just ask the class of ‘02

“...Just ask the class of ‘02

“The skills you learn at MIT are applicable to so many careers. Don’t be afraid of what career paths those skills may lead you to—even if it’s a bit unconventional.”

-Kelly Shannon, FBI Special Agent, Bio major

“The education you get at MIT is valuable no matter what field.”

- Kenji López-Alt, Award-Winning Cookbook Writer, Architecture Major

“A Biological Approach to Writing Fiction

“MIT is the type of place where you need self-discipline and a willingness to take risks and try a different approach. Writing is no different.”

-Megan Miranda, NY Times Bestselling Author, Bio major

via Slice of MIT
How to Explore

1. Talk with people. Start with the Academic Expo, but don’t stop there!
2. Participate in an advising seminar
3. Do a UROP in a department of interest
4. Do an Internship/Externship
5. Try out non-credit activities
6. Take exploration and discovery subjects

(See the orientation guide or Office of the First Year website for a list!)
Have more than one interest? You are not alone.

100% of students complete a HASS concentration. Many HASS concentrations are only 2 classes away from a minor.

16% of students double major

27% of students complete at least 1 minor, 3% complete 2

Composite majors (e.g. 5-7), flexible majors (e.g. 2A), and interdisciplinary majors/programs (e.g. 21E, NEET, etc.) allow students to pursue related interests without having to complete two full majors.
Minors by Primary Major *

*Most popular minor listed for majors where over 30% of students complete a minor
Check-in

How many of you are feeling a little overwhelmed right now?

That’s okay. It’s normal. Your advisor and the extended advising staff, fellow students, and faculty can help you navigate.
Advice is everywhere!

resources.mit.edu

Your Advisor / Associate Advisor
Career Advising & Professional Development (CAPD)
OFY Staff
Dept. undergrad admins
UROP Office
Alumni Advisors Hub
OME Mentor Advocate Partnership (MAP)
Orientation Leaders
Resident Peer Mentors
First Gen Peer Mentor Program
International Students Assoc. Mentorship Program
Pre-Major Advising

Coordinated through OFY (details to come)

Can request advice in as many departments as you want

Different formats based on the needs and resources of each department
Finding your path is a process.
Keep in mind

You got in to MIT. (Really!)

The first-year can set you up for ANY major.

45% of first-years add/drop subjects in the first five weeks.

10% of students switch majors (after declaring).

Standard practice is to choose your major by the end of spring term of your first year
...but you have more flexibility than that if you want it!
The most important advice...

Slow down and find support

It might take one, two, or even three semesters to get used to MIT, so ease yourself into it.
Just ask

Vice Chancellor
• My email: iaw@mit.edu

First Year Experience Coordinator
• Kate’s email: katew@mit.edu

Primary Resources
• Your Advisor / Associate Advisor
• MIT Career Advising & Professional Development
• OFY Staff: To make an appointment, write to firstyear-www@mit.edu.
Let us know how we can help

Your advisors will ask you about...

- your personal objectives for the first year
- your academic objectives for the first year

Please think about these (it is important)
Agenda for today

✓ Core curriculum (GIRs)
✓ Experimental grading and credit limits
✓ Some advice:
  Explore, get calibrated, ask for help

4. Q & A with Tanner, Pooja, & Daniel
Tanner Bonner  Sophomore, Course 11-6 (Urban Planning with Computer Science)  
Minor in Data Science  •  FGP Student Advisor  •  creator of “FLIPOP”  •  CASE Special Projects  •  2019 Fall Career Fair director  
Worked on ed-tech through MISTI Italy  •  UROP in RLE Speech Communication Group  

Pooja Reddy  Senior, Course 3 (Materials Sci. & Eng.)  
Assoc. Advisor  •  MacGregor Peer Mentor  •  Pres. of Art Club  •  Was Course 4 (Arch.) minor  •  UROPing since first-year fall  •  TA for 3.016 (Computational & Math Prep for Materials Scientists)  •  MISTI France  •  ran workshops on assistive tech in India last IAP  

Daniel Gonzalez  Senior, Course 6-2 (Electrical Engineering and Computer Science)  
Minor in Business Analytics  •  Assoc. Advisor  •  Technique Managing Editor  •  Society of Hispanic Prof. Engineers  •  IFC JudComm Chair  •  MIT Student Life Podcast  •  Kappa Sigma  •  Spring ’18 Designing the First Year participant