

## Information on 18.03, Differential equations, Spring 2025

Welcome to 18.03! We all have different mathematical backgrounds and living situations, so please be patient with your fellow classmates (and with me and the recitation instructors, since surely there will be technological difficulties, if not mathematical ones!) Also, 18.03 is not a contest, but a community of people trying to learn together, so please join study groups and Piazza and help each other learn! — Prof. Bjorn Poonen

**Website (Canvas):** <https://canvas.mit.edu/courses/30007>

**Prerequisite:** None, but 18.02 (multivariable calculus) is a *corequisite*, which means that you should be taking 18.02 concurrently if you have not already taken 18.02 or equivalent.

### Questions:

- Registration issues: To switch recitation, use Canvas, Section Signup. If you run into issues, contact Sefanya Hope-Hiennadi in 2-110.
- Math: If you have a math question about some concept, or a question about the homework, or if you think you found an error in MITx, the notes, homework, or solutions, then post on Piazza and it should get answered quickly. Also, math is easier to explain in person, so for involved math questions, coming to office hours is best of all!
- Technical trouble with MITx (online text and Part A problems): Email Ziqi Fang; include the path/link/location where the problem exists.
- Logistical questions that other students might also have: Post on Piazza.
- Logistical questions specific to you: Email your recitation instructor and the 18.03 course administrator, Davis Evans.

If none of the above can help you, email me and include

- your full name,
- your recitation number (e.g., R09),
- your recitation leader's name.

**Instructor:** Bjorn Poonen (he, him, his), [poonen@math.mit.edu](mailto:poonen@math.mit.edu); see above about emailing.

**Course administrator:** Davis Evans, [djevans@mit.edu](mailto:djevans@mit.edu).

**Recitation instructors:** Lior Alon, Rodrigo Arrieta Candia, Ting-Wei Chao, Davis Evans, Ludovico Giorgini, Cameron Krulewski, Zhengjiang Lin, Miguel Moreira, Jia Shi.

**MITx program manager:** Ziqi Fang, [ziqifang@mit.edu](mailto:ziqifang@mit.edu) (available M-F, 9am-5pm).

**Office hours:** Any 18.03 student is welcome at any 18.03 instructor's office hours, starting February 10. For times and locations, see Canvas, Office hours. Highly recommended!

**Required text:** None. The main references will be the lecture notes (Canvas, Lecture notes) and the MITx online text (Canvas, Modules); both will be updated as the semester progresses. MITx is integrated into Canvas for this class, so *you do not need to enroll in MITx*; everything is on Canvas (this may be different from your experience in other classes).

The lecture notes and the MITx text will be similar (because much of the MITx text was developed from my own Spring 2014 lecture notes), but the MITx text includes more worked examples and self-tests than there is time for during lectures. Additional optional material can be found in Canvas, Supplementary notes.

### How to prepare:

- Check on Canvas that you are enrolled in a recitation section that works for you.
- Please do not change your Canvas notification setting for Announcements — it should be “Notify me right away”.
- Check the midterm exam dates now to make sure that you have no conflict.
- Sign up on Piazza, the forum we will be using for asking and answering questions. Note: Piazza sends an email to the whole class each time you edit a post, so try to get it right the first time! Email the Piazza developers if you have technical problems or feedback for them.
- Find a study group to join at [psetpartners.mit.edu](http://psetpartners.mit.edu).
- Read “Using the MITx platform” in Canvas, Modules to learn about MITx’s quirks, such as requiring you to write  $2*x$  instead of  $2x$ , and `sin(x)` instead of `sin x`.

### Lectures:

- MWF 1–2pm in 10-250, from Feb 3 to May 12, 2025. In-person participation at lectures and recitations is expected for anyone enrolled for credit. There is not an option to watch a video recording afterward, but detailed lecture notes will be posted after each lecture.
- Masks are optional at MIT. Because I have asthma and hence need to be more careful with covid than most people, I will wear a mask myself, but it is up to you whether to wear one. Doing so might be advisable when covid levels are high. MIT people can obtain free high-quality KF94 masks from vending machines on campus.
- Food and drink in MIT classrooms are prohibited, so please finish lunch *before* entering the classroom!
- Attendees not officially enrolled for credit or as listener may be asked to leave if the room is too full.
- I recommend that you keep electronic devices off and avoid having private conversations during class, to avoid distracting other students.
- There is no need to take detailed notes, since lecture notes will be posted after each lecture.
- For a tentative schedule of topics, see Canvas, Schedule.

### Assignments:

- Reading assignments on MITx are best completed *before* the topic is discussed in lecture.
- There will be 8 problem sets, due at **11:30 P.M. Eastern Time** on the following dates: Tues Feb 11, Tues Feb 18, Tues Mar 4, Tues Mar 11, Tues Apr 1, Thurs Apr 10, Tues Apr 29, Thurs May 8. Each has a Part A and a Part B (named 1A and 1B, . . . , 8A and 8B).

- Part A (short-answer problems) is to be completed online on MITx (Canvas, Modules). These are automatically graded and give you immediate feedback. Some have a limit on the number of attempts.
- Part B (longer or more conceptual problems) will be posted online in Canvas, Files. Students should upload solutions to Gradescope.
- Only students expecting to be officially enrolled for credit (as an MIT student or officially cross-registering from Harvard or Wellesley) should submit Part B. If you are intending to remain a listener, you may do Part A, but do not submit anything on Gradescope; if you do Part B, *self-grade* it using the posted solutions.
- Please do not post solutions on Piazza or elsewhere before a problem is due.
- You should not expect to be able to solve every problem on your own; instead you are encouraged to discuss questions with each other and to come to office hours, so that when you submit an assignment you are pretty sure that it is complete and correct. You might learn best if you attempt as many problems as you can before meeting with your study group. **Write-ups must be done independently.** (This means that it is OK for other people to explain their solutions to you, but you must not be looking at other people’s solutions as you write your own.)
- Typesetting your solutions using  $\LaTeX$  is not required (but if you want to learn it, I recommend Grätzer, *More math into  $\LaTeX$* , which you can access online for free through MIT). If writing solutions by hand, please scan them into PDFs.
- Write in complete sentences with correct grammar, using the MITx text as a model.
- Solving the problem is nice, but the *real* challenge is to make your solution as clear as possible, impossible to misunderstand or misinterpret!
- Each Part B problem set ends with a fake problem called “Sources consulted”. Your “solution” to this problem should consist of the words “Sources consulted: none” OR a list of all sources consulted other than the books above and lecture notes. **This is required.** (Examples of things that should be named if consulted: a classmate, a tutor, a friend, a website, AI, a textbook not listed above, solutions from a previous semester, etc. And remember, if you consult these, you must write your solutions afterwards while not looking at them.) For some problems, there may exist solutions of varying quality online; you are discouraged from using these; if you look at one of these, or look at solutions written by students or professors in previous semesters, you *must* mention the precise source on your assignment. Use of cheating websites such as [chegg.com](http://chegg.com) as a consumer or provider is forbidden.
- For each problem, including the “Sources consulted” problem, indicate in Gradescope which pages of your PDF it appears on, following page 3 of these instructions.
- **Late submissions will not be accepted.** They will not be graded and will receive zero credit, unless excused (but these zeros may be boosted up to your midterm–final average as explained in the grading policy). The only exception is a grace period, allowing submission until 11:59 P.M. on the due date; this grace period is in case of technical difficulties only — *the official deadline is 11:30 P.M.* The sites will not permit uploading of solutions at or after 11:59 P.M, and solutions may not be submitted by email. So plan to submit a little early.
- Part A solutions will be visible immediately after you solve a problem or run out of attempts, and in any case after the grace period ends. Part B solutions will be in

Canvas, Files at 9:00 A.M. the next day. Reading them is recommended even if you solved all the problems, since there are usually different ways to present a solution.

- Because solutions are posted, extensions will generally not be granted, even with a recommendation from S<sup>3</sup> or GradSupport. But with such a recommendation you might be *excused* from completing part or all of the assignment.
- If a correct and clearly written solution of yours was not awarded credit, please first read the posted solution set for comparison, and then submit a regrade request through Gradescope. Regrades for problem sets or exam problems must be requested within a week of receiving the grades. If after submitting a regrade request, the grader denies you credit but you still feel that your solution is correct, then you may appeal to your recitation instructor via email.

**Exams:** There will be three 50-minute midterms, on Monday February 24 at 1pm, Monday March 17 at 1pm, and Wednesday April 16 at 1pm in 10-250 and 50-340 (upstairs in Walker Memorial); you will be told which location to go to. In addition, there will be a 3-hour final exam on Friday May 16, 1:30-4:30pm in Johnson Track upstairs. If you are using accommodations, or get sick, or have a conflict exam, it might be at a different time, announced only after Drop Date. If you book travel before the end of finals week, and it later turns out that you need to take an exam after your planned departure, you will have to rebook your travel; to be safe, travel only after 5pm May 21. Notes, books, and electronic devices are not permitted during exams.

Individual job interviews and family vacations are not a reason to skip an exam; they should be scheduled outside exams. If an official MIT sports event conflicts with a midterm, please have your coach contact the course administrator well in advance; we might have the coach administer the exam to you. You can be excused from a midterm only with a medical excuse or *prior* arrangement (as early as possible). Any request within 24 hours of the exam must go through S<sup>3</sup> or GradSupport. Unlike in 18.02, there will be no make-up midterms; for those excused, the other exam grades will be averaged.

**Grading:** The weighting is: homework 4, midterms 6, final 5. Each homework grade below your midterm–final average will be boosted up to that average, except as noted in the detailed grading policy.

**MIT help resources:** Your friendly lecturer, your friendly recitation leader, the Math Learning Center, Mathematics Academic Services 2-110, the MIT Division of Student Life, and the Talented Scholars Resource Room. See this chart for an even longer list of help resources at MIT.

**If a personal or medical issue is interfering with your studies:**

- Contact your medical provider if you need medical attention.
- Please do not come to class if you are potentially contagious. *This applies even if you test negative for covid and it is just a cold, say.* Instead keep up with the assigned readings if you can, and read the lecture notes posted after each lecture.
- Email the course administrator and your recitation leader.
- If you are dealing with a personal or medical issue that is impacting your ability to attend class, complete work, or take an exam:

- Undergraduates should contact a dean in Student Support Services (S<sup>3</sup>): reach out to one you have worked with before, join the virtual help queue, email [s3-support@mit.edu](mailto:s3-support@mit.edu), or call 617-253-4861.
- Graduate students should contact a dean in GradSupport at [gradsupport@mit.edu](mailto:gradsupport@mit.edu) or 617-253-4860.

These offices are here to help you. The deans will provide you with support, and help you work with us to determine next steps. In most circumstances, students will not be excused from coursework without verification from a dean. Then your missing homework scores will be replaced by your midterm–final average. If you have some other kind of conflict, email only the course administrator and your recitation leader (not a dean) as far in advance as possible, and the course administrator will make a decision on how to proceed.

- Typically, if excused, you will not get a deadline extension, but your remaining scores will be averaged. If you do the problem set later on, you can self-grade it using the posted solutions and come to office hours with questions.
- If facing financial challenges, please connect with S<sup>3</sup>.

*Note:* Generally, you are expected to choose a manageable courseload and to manage your time, so work in other classes is usually not a reason to be excused from coursework in this class. Similarly, students are expected to avoid taking classes at the same time that have conflicting midterms, so having a midterm in another class is not a valid excuse for skipping an 18.03 midterm. Since assignments and materials are online, you are expected to submit problem sets even if you are temporarily away from MIT. If in a particular week there are extenuating circumstances, you must go through a dean as above to request an exemption.

**If you need disability accommodations:** Please speak with Kathleen Monagle, Associate Dean at Disability and Access Services (DAS), ideally before the semester begins or early in the semester, by visiting 5-104 or calling 617-253-1674. If you have a disability but do not plan to use accommodations, it is still recommended that you meet with DAS staff to familiarize yourself with the services and resources of the office. If you have already been approved for accommodations, please email a PDF copy of the accommodation letter to Sefanya Hope-Hiennadi in Mathematics Academic Services 2-110 early in the semester or as soon as you receive it.

### **Other important things:**

- It is your responsibility to email the course administrator and your recitation leader as far in advance as possible in case of an unavoidable conflict with an exam, in case of an extended absence, or in case you find yourself struggling with the course for any reason.
- If you have emergency medical information you wish to share with me and/or your recitation instructor, or if you need special arrangements, in case the building must be evacuated, please inform us immediately: feel free to talk to me privately after class or in my office.