

18.02A Multivariable Calculus Syllabus (First Half) Fall 2023

Note: Specific readings and exercises will be listed on the problem sets.

M	Oct. 23	0.	First recitation. Introduction to vectors.
T	Oct. 24	1.	Scalar (dot) product. Matrices.
R	Oct. 26	2.	Determinants; cross product
F	Oct. 27	3.	Matrices as transformations; inverse matrices
T	Oct. 31	4.	Linear Algebra and systems of linear equations.
R	Nov. 2	5.	Basis. Square systems of eqns.; Cramer's rule, eqns. of planes
F	Nov. 3	6.	Eigenvalues and eigenvectors
T	Nov. 7	7.	Polar coordinates. Complex numbers. Problem Set 1 due
R	Nov. 9	8.	Parametric equations of lines and curves; the cycloid. Vector derivatives.
F	Nov. 10		<i>Veteran's Day Holiday</i>
T	Nov. 14	9.	Applications
R	Nov. 16	10.	Intro to functions of several variables; graphs, level curves, partial derivatives, tangent plane approximation
T	Nov. 17		TEST 1 covers through Lecture 9, 1 hour, 1pm.
F	Nov. 21	11.	Critical points and max-min problems. Least squares. Problem Set 2 due
	Nov. 23-24		<i>Thanksgiving Holiday</i>
T	Nov. 28	12.	Second derivative test.
R	Nov. 30	13.	Gradient and its applications.
F	Dec. 1	14.	Lagrange multipliers. Chain rule.
T	Dec. 5	15.	Double and iterated integrals in rectangular coordinates.
R	Dec. 7	16.	Double integrals in polar coordinates.
F	Dec. 8	17.	Applications of double integrals. Problem Set 3 due
T	Dec. 12	18.	Midterm Review.
Exam Period			TEST 2 covers through Lecture 18, 2 hours. <i>Date TBA, as late as 12/22.</i>

18.02A Fall 2023 Course Policies

Welcome to 18.02A! Here is a brief outline on how the course will be run in Fall 2023:

- Lectures are in person but will be recorded and posted on Canvas under panopto video. **We strongly encourage you to attend lectures in person.** Recitations will not be recorded.
- There will be one **50-minute test (11/17, during class time)** and a **2-hour midterm exam during the finals period**. The latter could be as late as 12/22, so do not buy any plane tickets departing before the evening of 12/22.
- **There will be three problem sets due on 11/7, 11/21 and 12/8.** P-sets consist of two parts: part A problems submitted through MITx and part B problems submitted through Gradescope. The p-sets are long; please start well in advance of the due date. We encourage you to work together on p-sets; each student must submit their own assignment.
- **Extensions.** This class moves quickly and it is critical for success not to fall behind. There are only 3 p-sets; we hope that there will be no need for extensions. That said, things happen, so each student gets **one** free 24 hour extension with no penalty. Other than this, unapproved late p-sets will be deducted 10% for the first 24 hours and 50% after 24 hours.
- Your temporary score at the end of the first half of 18.02A will be calculated based on the cumulative total = 40% problem sets + 20% 50-minute test + 35% 2-hour midterm + 5% recitation participation. Each half of 18.02A will be 50% of your final grade. Grade cut-offs are targeted at 90% for an A, 80% for a B and 70% for a C.¹
- Your recitation sections are the same as for 18.01A. Attendance here is mandatory and participation will be 5% of your grade.
- Write to your TA for PSET and recitation related questions. For most other inquiries write to the course admin Omri Ben-Eliezer (omrib@mit.edu). **If you have a conflict for a test or need accommodations, we need 48 hours notice.**² Not all conflicts will be approved - e.g., the math department does not recommend taking conflicting classes and this is not an approved conflict.
- Support Resources: Math learning center (MLC), tutoring opportunity provided by math department and Talented Scholar Resource Room (*TSR*²), academic support and resources. Student Support Services (*S*³) can be really helpful if you have any emergencies.

¹MIT does not have curves. Cut-offs will not be higher than this, but there is a small chance these numbers will be lowered if we make an exam too difficult.

²If an unexpected emergency happens within 48 hours, please contact *S*³ for guidance and support.