

MA 113**Calculus II**

- Course Description:** Applications of definite integrals: area, volume, improper integrals, work, arc length, surface area, centroid. Polar coordinates. Parametric curves in two and three dimensions: velocity, speed and acceleration. Partial derivatives and the chain rule, properties of the gradient. Maxima and minima. Sequences and series: convergence of sequences and series, Taylor and Maclaurin series, power series. *4 credits; 4 contact hours.*
Prerequisite: Ma111; prerequisite or corequisite: Ma110.
- Department Policy:** The Cooper Union has recently made the decision to reduce the contact hours for this course from 5 to 4. This decision precludes the Department of Mathematics from supporting the delivery of examples of application of the theoretical material covered in the course, as well as discussing solutions to homework exercises, during the lecture hours. Detailed elaboration on applications and nuances for solving the homework required in this course will be discussed outside of class with the instructor, during office hours; we advise all students to set up study groups and take advantage of the excellent collaborative environment at Cooper. In addition, we advise students to make ample use of all office hours provided by the professors of the Department and to reach out to the Dean's Office if they have concerns regarding the recent policy changes.
- Course Objectives:**
1. Apply the definite integral to solve problems in geometry, physics, and other fields.
 2. Introduce the differential calculus of functions of several variables and solve multivariable constrained optimization problems.
 3. Develop the mathematical theory of sequences and series.
- Instructor:** Mili Shah (mili@cooper.edu)
41 Cooper Square, Room 311
<http://faculty.cooper.edu/mili>
- Meetings:** Lecture: Wednesday 09:00AM - 10:50AM, 41 Cooper Square, Room 101
Lecture: Friday 9:00AM - 10:50PM, 41 Cooper Square, Room 505
Office Hours: Wednesday 11:30AM-1:00PM or by appointment
- Participation:** Please contribute to the classroom environment by asking questions and participating in discussions. Your interaction will be considered when assigning borderline grades, as will improving performance throughout the course of the semester.
- Exams:** Three exams (20% each) and one final (30%) will be given during the semester. Each exam will be one hour and the final will be two hours. You may not use outside resources: calculators, other students, other books, etc. Exams will be given in Rose Auditorium.
- Homework:** Homework from the prior week's lectures will be due Wednesdays at 1pm. Grading will consist of 50% for completion and 50% for correctness on a subset of the problems. Collectively, the homework will constitute 10% of your final grade.
- Grading:** Homework: Due Wednesdays at 1pm (10% of final grade)
Exam 1: Friday, February 8 (20% of final grade)
Exam 2: Friday, March 8 (20% of final grade)
Exam 3: Friday, April 12 (20% of final grade)
Final Exam: Wednesday, May 8 (30% of final grade)
Note: I reserve the right to adapt exam dates and location.
- Late policy:** No work will be accepted late without prior arrangement or a written excuse. Neither exam or final may be made up without prior arrangement or a written excuse. Late work or makeup exams due to religious observances must be obtained during the first week of class.
- Text:** Thomas, Weir, and Hass, *Thomas' Calculus*, 12th edition, Pearson (2009)
ISBN-13: 978-0321587992
- Disabilities:** If you believe you are entitled to an accommodation on assessments through the Americans with Disabilities Act, you must self-identify to the Office of the Dean of Students and meet with me during the first week of the term to discuss arrangements for meeting your accommodation.

Date	Homework
01/16	11.1: 1,3,5,12,17,21,33,34,35,38,39 11.2: 3,7,13,21,22,23,25,27,41
01/18	6.3: 1,3,5,7,9,21,22,24,29 12.1: 28,31,59,60,63,65
01/23	12.2: 13,33,41,45,51,55 12.3: 16,18,25,45
01/25	12.4: 16,26,27,28,29,33 12.5: 9,20,21,31,35,42,46,55,65,67,71,74
01/30	13.1: 1,3,9,11,19,24,27 13.2: 1,3,5,7,9,11,13,15,17,21,24,28,31,44
02/01	13.3: 1,3,9,11,13,17,18,19 13.4: 1,3,5,6,7,9,11,19,20,23,25
02/06	13.5: 1,3,7,9,17,18,19,23,26,28 6.1: 2,5,7,11,19,21,27,37,45,49,51,56,59
02/08	Exam 1
02/13	6.2: 1,5,7,9,23ac,28,29,34,39,41,44 6.4: 1,3,5,7,9,13,15,17,24,28,31
02/15	President's Day
02/20	11.2: 31,34,35,37,44 6.5: 3,10,15,22,25,27,30,34,39,42,45
02/22	6.6: 1,3,5,13,25,27,29,33,37,43 11.3: 1,3,5,7,11,13,15,27,35,47,55,59,61,68
02/27	11.4: 3,8,13,16,17,19,21a,23a,27 11.5: 1,3,6,9,11,16,19,20,21,23,30ab,31
03/01	11.6: 1,2,3,4,5,6,7,8,9,15,19,23,25,29,33,36,53,57,63,69,70,73,77,81 11.7: 1,3,5,7,9,13,19,21,23,25,30,31,37,39,41,45,50,57,75a
03/06	13.6: 1,4,6,7,8
03/08	Exam 2
03/13	Spring Break
03/15	Spring Break
03/20	10.1: 1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,43,45 47,49,51,54,56,59,60,63,68,69,71,80,88,81,89,93,97,98,101,104a,107,113,119,133a
03/22	10.2: 9,13,21,25,27,29,31,33,37,41,45,55,58,65,69,73,79,83,88,89,93,94 10.3: 1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,43a,45,49,57
03/27	10.4: 1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,43,45,47,49,51,57,58,60 10.5: 1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,43,47,53,56,61,63
03/29	10.6: 1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,43,45,47,49,53,55,57,59,64,66 10.7: 1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,39,45,47,49,50,55,56
04/03	10.8: 1,3,7,11,19,21,27,32,35,39,41 10.9: 1,7,9,11,27,29,37,41,43,45,46,48,52
04/05	10.10: 3,5,15,17,19,25,29,33,41,44,52,56,59a App 7: 1,3,5,7,9,11,13,17,23,29,30 (p.604: 67,68,69,70,71,73)
04/10	14.1: 5,7,9,11,13,15,17,19,21,23,25,31,32,33,34,35,36,49,51,53,57,59,61,62,65,67 12.6: 1,2,3,4,5,6,7,8,9,10,11,12,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,43,45,47
04/12	Exam 3
04/17	14.2: 1,3,5,7,9,15,17,19,21,27,31,35,34,39,43,45,47,49,53,54,56,60,61,63,70 14.3: 3,6,17,21,29,39,43,49,51,58,60,62,63,66,69,75,83,90
04/19	14.4: 3,11,14,19,25,29,35,39,41,44,50,52 (Stein 14.11: 5,7,8,11) 14.5: 1,3,5,7,9,11,13,15,21,27,29,32,33,34,35,38
04/24	14.6: 1,3,5,7,9,11,17,19,23,25,35,43,51,54,57,59,66,67 14.9: 5,9,12
04/26	14.7: 3,5,9,15,31,35,43,45,47,49,51,59,61,65 14.8: 1,5,9,13,21,29,32,33,35,42,43
05/01	Review
05/03	Review
05/08	Final Exam