

MATH 112: Calculus II

Summer 2022 Course Syllabus

NJIT Academic Integrity Code: All Students should be aware that the Department of Mathematical Sciences takes the University Code on Academic Integrity at NJIT very seriously and enforces it strictly. This means that there must not be any forms of plagiarism, i.e., copying of homework, class projects, or lab assignments, or any form of cheating in quizzes and exams. Under the University Code on Academic Integrity, students are obligated to report any such activities to the Instructor.

COURSE INFORMATION

Course Description: Topics include integration, applications of integration, series, exponential and logarithmic functions, transcendental functions, polar coordinates, and conic sections.

Number of Credits: 4

Prerequisites: MATH 111 with a grade of C or better or MATH 132 with a grade of C or better.

Course-Section and Instructors:

Course-Section	Instructor
Math 112-031	Professor J. Ratnaswamy
Math 112-032	Professor J. Ratnaswamy
Math 112-131	Professor S. Alptekin

Office Hours for All Math Instructors: [Office Hours and Emails](#)

Required Textbook:

Title	<i>Thomas' Calculus: Early Transcendentals</i>
Author	Thomas
Edition	14th
Publisher	Pearson
ISBN #	978-0134768496 (bound) 9780134768762 (looseleaf)

University-wide Withdrawal Date: Please see the [Summer 2022 Academic Calendar](#) for the last day to withdraw based on the summer session you are registered for.

COURSE GOALS

Course Objectives

- Students should (a) learn about limits and their central role in calculus, (b) learn about derivatives and their relationship to instantaneous rates of change, (c) understand many practical applications of derivatives, (d) gain experience in the use of approximation in studying mathematical and scientific problems, (e) learn about integrals: their origin in the area problem and their relationship to derivatives.
- Students should gain an appreciation for the importance of calculus in scientific, engineering, computer, and other applications.
- Students should gain experience in the use of technology to facilitate visualization and problem solving.

Course Outcomes

- Students have improved logical thinking and problem-solving skills.
- Students have a greater understanding of the importance of calculus in science and technology.
- Students are prepared for further study in mathematics as well as science, engineering, computing, and other areas.

Course Assessment: The assessment of objectives is achieved through homeworks, quizzes, and common examinations with common grading.

POLICIES

DMS Course Policies: All DMS students must familiarize themselves with, and adhere to, the [Department of Mathematical Sciences Course Policies](#), in addition to official [university-wide policies](#). DMS takes these policies very seriously and enforces them strictly.

Grading Policy: The final grade in this course will be determined as follows:

Homework and Quizzes	15%
Midterm Exam I	25%
Midterm Exam II	25%
Final Exam	35%

Your final letter grade will be based on the following tentative curve.

A	88 - 100	C	65 - 71
B+	83 - 89	D	60 - 64
B	77 - 82	F	0 - 59
C+	72 - 76		

Attendance Policy: Attendance at all classes will be recorded and is **mandatory**. Please make sure you read and fully understand the [Math Department's Attendance Policy](#). This policy will be strictly enforced.

Homework Policy: Calculus is learned by solving problems. In Math 112, there are two kinds of homework

assignments: 1) assignments which are written out by hand and turned in, and 2) assignments which are completed online. The homework assignments are listed on the syllabus; the * superscript denotes those problems which constitute the hand-in assignments while the remaining problems constitute the online assignments.

The online assignments can be completed at WWW.MYMATHLAB.COM. In order to access the online assignments you need to have a student access code. Access codes are included with a new book that is bundled with MyMathLab; codes can be purchased separately from the textbook at the campus bookstore or online at the course website. If you buy a new book from another source **make sure it is bundled with MyMathLab**. In addition, on the first day of class your course instructor will give you an additional code needed to access the online assignments. **NOTE: Homework Assignments are DUE frequently (at least weekly) at the dates and times specified online and by your instructor.**

How to Get Started with MyMathLab:

- **GETTING STARTED**
- **TECHNOLOGY TIPS**

MATLAB Assignments: MATLAB is a mathematical software program that is used throughout the science and engineering curricula. One MATLAB assignment will be given during the semester; tutors are available to help students having difficulties in accordance with a posted [schedule](#).

Quiz Policy: Quizzes are given in class on a frequent basis (at least weekly). All of the quizzes will be graded. The homework and quizzes are intended to develop your problem-solving skills and to help you prepare for the exams.

Exams: There will be two common midterm exams held during the semester and one comprehensive common final exam. Exams are held on the following days:

Midterm Exam I	June 15, 2022
Midterm Exam II	July 20, 2022
Final Exam	August 8, 2022

The final exam will test your knowledge of all the course material taught in the entire course. Make sure you read and fully understand the [Math Department's Examination Policy](#). This policy will be strictly enforced.

Makeup Exam Policy: There will be **NO MAKE-UP QUIZZES OR EXAMS** during the semester. In the event an exam is not taken under rare circumstances where the student has a legitimate reason for missing the exam, the student should contact the Dean of Students office and present written verifiable proof of the reason for missing the exam, e.g., a doctor's note, police report, court notice, etc. clearly stating the date AND time of the mitigating problem. To properly report your absence from a midterm or final exam, please review and follow the required steps under the DMS Examination Policy found here:

http://math.njit.edu/students/policies_exam.php

Cellular Phones: All cellular phones and other electronic devices must be switched off during all class times.

ADDITIONAL RESOURCES

Math Tutoring Center: Located in the Central King Building, Lower Level, Rm. G11 (See: [Summer 2022 Hours](#))

Accommodation of Disabilities: The Office of Accessibility Resources and Services (OARS) offers long term and temporary accommodations for undergraduate, graduate and visiting students at NJIT.

If you are in need of accommodations due to a disability please contact Scott Janz, Associate Director of Disability Support Services at [973-596-5417](tel:973-596-5417) or via email at scott.p.janz@njit.edu. The office is located in Kupfrian Hall, Room 201. A Letter of Accommodation Eligibility from the Office of Accessibility Resources and Services office authorizing your accommodations will be required.

For further information regarding self identification, the submission of medical documentation and additional support services provided please visit the Office of Accessibility Resources and Services (OARS) website at:

<https://www.njit.edu/studentssuccess/accessibility/>

Important Dates (See: [Summer 2022 Academic Calendar](#), [Registrar](#))

Date	Day	Event
May 23, 2022	Monday	Full, First, and Middle Summer Session Begins
May 25, 2022	Wednesday	Last Day to Add/Drop for First Summer Session
May 27, 2022	Friday	Last Day to Add/Drop for Middle Summer Session
May 30, 2022	Monday	Last Day to Add/Drop for Full Summer Session
May 30, 2022	Monday	Memorial Day - University Closed/No Classes Scheduled
June 11, 2022	Saturday	Last Day to Withdraw from First Summer Session
June 17, 2022	Friday	Last Day to Withdraw from Middle Summer Session
June 27, 2022	Monday	Last Day of Classes for First Summer Session
July 1, 2022	Friday	Last Day to Withdraw from Full Summer Session
July 3, 2022	Sunday	Independence Day - University Closed/No Classes Scheduled
July 4, 2022	Monday	Independence Day - Holiday Observance/No Classes
July 5, 2022	Tuesday	Second Summer Session Begins
July 6, 2022	Wednesday	Last Day to Add/Drop for Second Summer Session

July 18, 2022	Monday	Last Day of Classes for Middle Summer Session
July 21, 2022	Thursday	Last Day to Withdraw for Second Summer Session
August 8, 2022	Monday	Last Day of Classes for Full and Second Summer Session

Course Outline

Lecture #	Section #	Subject Topic	Assignment in MyMathLab	Assignment to Hand-in
1	5.6	<i>Review of Integration, u/du substitution</i>	Section 5.4 #s: 1, 23, 31 Section 5.5 #s: 18, 20, 21, 25, 33, 43, 47, 59 Section 5.6 #s: 27, 29, 37, 53	
2	6.1	<i>Volumes Using Cross Sections</i>	1, 5, 9, 17, 19, 23, 30, 33, 37, 41, 45, 47, 49, 51, 53, 55, 59	10, 38, 54
3	6.2	<i>Volumes Using Cylindrical Shells</i>	3, 5, 9, 11, 17, 19, 21, 25, 29, 33	42, 47, 48
4	6.3	<i>Arc Length</i>	1, 2, 3, 4, 5, 7, 15, 27	13, 28
5	6.4	<i>Areas of Surfaces of Revolution</i>	9, 13, 15, 17, 19, 21, 24	32
6	6.5	<i>Work</i>	1, 5, 7, 8, 9, 11, 15, 17, 19, 20	10, 21
7	7.3	<i>Hyperbolic Functions</i>	2, 7, 9, 15, 17, 23, 43, 45, 47, 49, 53, 55, 57, 81	80
	8.1	<i>Using Basic Integration Formulas</i>	3, 5, 9, 10, 13, 15, 27, 33, 36, 38	34, 37
8	8.2	<i>Integration by Parts</i>	3, 5, 11, 13, 23, 27, 29, 33, 35, 37, 39, 45, 47, 59	28, 38, 46, 57
9	8.2	<i>Trigonometric Integrals</i>	7, 9, 11, 17, 19, 21, 27, 31, 35, 37, 38, 39, 45, 65, 71	63, 64, 68
10	8.3	<i>Trigonometric Substitution</i>	1, 5, 7, 11, 17, 19, 23, 29, 35, 37, 39, 41, 43, 47, 43, 53	12, 20, 44, 50
11	8.4	<i>Integration of Rational Functions by Partial Fractions</i>	3, 7, 11, 14, 16, 17, 19, 23, 25, 27, 29, 33, 35, 39, 41, 45, 55	18, 30, 31, 38
12	8.5	<i>Numerical Integration</i>	3, 7, 13, 17, 21, 28	
13	8.7	<i>REVIEW FOR EXAM I</i>		
14	8.8	<i>EXAM I: 6/15/22</i>		

15		<i>Improper Integrals</i>	1, 4, 6, 7, 9, 11, 13, 17, 21, 23, 31, 33, 39, 43, 45, 51, 55, 57, 59, 63, 65, 67, 71, 73	16, 28, 58, 68, 75
16	8.8	<i>Sequences</i>	3, 7, 9, 15, 17, 21, 23, 25, 35, 39, 41, 45, 49, 53, 55, 57, 65, 69, 71, 79, 89, 91, 97, 99, 109	52, 54
17	10.1	<i>Infinite Series</i>	3, 5, 7, 13, 29, 33, 35, 41, 45, 47, 57, 59, 63, 65, 69, 77, 79, 98	74, 80, 84, 90, 67, 68
18	10.2	<i>Integral Test</i>	3, 6, 9, 13, 15, 21, 27, 29, 31, 33, 35, 37, 55, 57	22, 36, 38
19	10.3	<i>Comparison Tests</i>	1, 5, 18, 19, 21, 23, 25, 28, 31, 32, 34, 37, 39, 41, 43, 47, 51, 58	36, 40, 46
20	10.4	<i>Root and Ratio Tests</i>	5, 7, 9, 18, 19, 21, 29, 31, 35, 42, 57, 59, 61, 70	38, 58, 60
21	10.5	<i>Alternating Series, Absolute vs. Conditional Convergence</i>	5, 7, 9, 10, 11, 13, 15, 19, 21, 23, 25, 27, 34, 35, 37, 39, 41, 44, 47, 51, 53, 63, 71, 73	12, 24, 30, 42, 50
22	10.6	<i>Power Series</i>	3, 5, 9, 11, 15, 19, 21, 23, 27, 31, 37, 39, 43, 45, 53, 54	22, 24, 32, 55
23	10.7	<i>Taylor and McLaurin Series</i>	3, 5, 8, 9, 11, 15, 18, 25, 31, 33, 37	36
24	10.8	<i>Convergence of Taylor Series</i>	1, 9, 10, 13, 15, 21, 22, 27, 31, 39, 41, 43, 45, 47, 53	18, 28, 33, 40, 52
25	10.9	<i>REVIEW FOR EXAM II</i>		
26		<i>EXAM II: 7/20/2022</i>		
27	10.1	<i>Applications of Taylor Series</i>	1, 3, 5, 13, 23, 25, 29, 31, 35, 39, 45, 49, 55, 61	26, 40
28	11.1	<i>Applications of Taylor Series</i>	1, 3, 5, 7, 9, 16, 29, 31, 35, 37, 41, 43, 49	12, 42, 50
29	11.2	<i>Calculus with Parametric Curves</i>	7, 9, 12, 13, 15, 21, 26, 28, 29, 31, 33, 35	14, 47
30	11.3	<i>Polar Coordinates</i>	1, 5, 7, 13, 17, 23, 27, 32, 37, 47, 51, 59, 60, 61	38, 42
31	11.4	<i>Graphing in Polar Coordinates</i>	1, 7, 9, 13, 17, 19, 29, 31	18
32	11.5	<i>Graphing in Polar Coordinates</i>	1, 7, 11, 13, 15, 17, 21, 23, 27, 28	10, 24
33		<i>CATCH UP AND REVIEW</i>		
		<i>FINAL EXAM</i>		

