MATH 112 : Calculus II
Fall 2025 Course Syllabus

NJIT Academic Integrity Code: Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: NJIT Academic Integrity Code.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu

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 112-001	Professor J.H. Ro
Math 112-003	Professor J.H. Ro
Math 112-005	Professor K. Carfora
Math 112-007	Professor K. Carfora
Math 112-009	Professor D. Schmidt
Math 112-011	Professor D. Schmidt
Math 112-013	Professor J.H. Ro
Math 112-015	Professor A. Flax

Math 112-017	Professor V. Barreto Aranda
Math 112-019	Professor R. Dandan
Math 112-021	Professor N. Tsipenyuk
Math 112-023	Professor N. Tsipenyuk
Math 112-025	Professor A. Flax
Math 112-027	Professor A. Flax
Math 112-029	Professor K. Wicke
Math 112-101	Professor H. Behzadpour

Office Hours for All Math Instructors: Office Hours and Emails

Required Textbook:

Title	*Thomas' Calculus: Early Transcendentals*
Author	Hass, Heil, and Weir
Edition	15th
Publisher	Pearson
ISBN #	9780137559893 9780137560042

University-wide Withdrawal Date: The last day to withdraw with a **W** is **Monday, November 10, 2025**. It will be strictly enforced.

STUDENT RESPONSIBILITIES

- Read and understand the syllabus.
- Adhere to all policies and procedures
- Report conflicts and/or special circumstances in a timely manner
- Report any instances of violations of Academic Integrity to your Instructor
- Communicate directly with your Instructor on ALL course-related matters, including material, procedures, policies and exams. **NOTE: Do not attempt to contact other instructors or the course Coordinator - you will not get a response. All course information will be communicated to you directly by your instructor.**
- Effectively manage time and devote sufficient time to succeeding in this course

- Keep track of your grades
- Make use of all resources available to help you learn
- Be respectful of peers and your instructor
- Accept responsibility for your grades – requests for extra credit opportunities will be denied

COURSE GOALS

Course Objectives

- Students should (a) develop greater depth of understanding of integration and its importance in scientific and engineering applications, (b) learn about series, including their convergence properties and their use in representing functions, (c) gain experience in the use of approximation in studying mathematical and scientific problems and the importance of mathematically understanding and evaluating the accuracy of approximations, (d) learn new ways of mathematically representing curves and how to use calculus in these settings, and (e) learn alternative coordinate systems which are natural for many problems and learn how calculus can be applied in these systems.
- 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:

Quizzes and Homework	17%
Common Midterm 1	17%
Common Midterm 2	17%
Common Midterm 3	17%
Final Exam	32%

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

A	88 - 100	**C**	66 - 71

B+	83 - 87	**D**	60 - 65
B	77 - 82	**F**	0 - 59
C+	72 - 76		

THE FINAL GRADE DISTRIBUTION WILL BE DETERMINED BY COURSE INSTRUCTORS IN A MEETING TO BE HELD AFTER THE FINAL EXAM.

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. Each class is a learning experience that cannot be replicated through simply "getting the notes."

Religious Observance: NJIT is committed to supporting students observing religious holidays. Students must notify their instructors in writing of any conflicts between course requirements and religious observances, ideally by the end of the second week of classes and no later than two weeks before the anticipated absence.

Homework: Homework is a requirement for this class. Online homework will be completed with MyMathLab, which comes with a new copy of the textbook. Access to it can also be purchased directly from the website.

Quizzes: Quizzes will be given approximately once a week throughout the semester. They will be based on the lecture, homework and the in-class discussions.

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

Common Midterm Exam I	October 1, 2025
Common Midterm Exam II	October 29, 2025
Common Midterm Exam III	December 3, 2025
Final Exam	December 14 - December 20, 2025

The time of the midterm exams is **4:15pm - 5:40 PM** for daytime students and **6:00 - 7:25 PM** for evening students. 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: 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

Mandatory Tutoring Policy: Based upon academic performance indicating a significant gap in understanding of the course material, students may receive a notice of being assigned to mandatory tutoring to assist in filling the gap. A student will have 2 points deducted from the course average for each instance in which the required tutoring is not completed by the stated deadline.

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: Fall 2025 Hours)

Further Assistance: For further questions, students should contact their instructor. All instructors have regular office hours during the week. These office hours are listed on the Math Department's webpage for Instructor Office Hours and Emails.

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 need an accommodation due to a disability, please contact the Office of Accessibility Resources and Services at oars@njit.edu, or visit Kupfrian Hall 201 to discuss your specific needs. A Letter of Accommodation Eligibility from the office authorizing student accommodations is 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/accessibility/

Important Dates (See: Fall 2025 Academic Calendar, Registrar)

Date	Day	Event
September 1, 2025	Monday	Labor Day
September 2, 2025	Tuesday	First Day of Classes
September 8, 2025	Monday	Last Day to Add/Drop Classes
October 2, 2025	Thursday	Wellness Day
November 10, 2025	Monday	Last Day to Withdraw
November 25, 2025	Tuesday	Thursday Classes Meet
November 26, 2025	Wednesday	Friday Classes Meet
November 27 to November 30, 2025	Thursday and Sunday	Thanksgiving Recess - Closed
December 11, 2025	Thursday	Last Day of Classes
December 12, 2025	Friday	Reading Day
December 13, 2025	Saturday	Saturday Classes Meet
December 14 to December 20, 2025	Sunday to Saturday	Final Exam Period

Lecture	Sections	Topic	Assignment in MyMathLab
1	6.1	Volumes Using Cross Sections	1,5,9,17,19,23,30,33,37
2	6.1	Volumes Using Cross Sections	41,45,47,49,51,53,55
3	6.2	Volumes Using Cylindrical Shells	3,5,9,11,17,19,21,25,29,33
4	6.3	Arc Length	1,2,3,4,5,7,15,27
5	6.4	Areas of Surfaces of Revolution	9,13,15,17,19,21,24
6	6.5	Work	1,5,7,8,9,11,15,17,19,20
7	7.3	Hyperbolic Functions	2,7,9,15,17,21,23,43,45,47,49,53,55,57,81
8	8.1/8.2	Using Basic Integration Formulas; start Integration by Parts	Section 5.5: 11,21,25,29,37,55 Section 8.1: 3,5,9,10,13,15,27,33,36,38
9	8.2/8.3	Finish Integration by Parts; start Trigonometric Integrals	Section 8.2: 3,5,11,13,23,27,29,33,35, 39,45,47,59
10	8.3/8.4	Finish Trigonometric Integrals; start Trigonometric Substitution	Section 8.3: 11,17,19,21,27,31,35, 37,38,39,45,65,71
11	8.4	Trigonometric Substitution	1,5,7,11,17,19,23,29,35,37,43,57
12	8.5	Integration of Rational Functions by Partial Fractions	3,7,9,13,14,16,17,19
13		**REVIEW FOR EXAM #1**	
14	8.5	Integration of Rational Functions by Partial Fractions	23,25,27,29,33,35,39,41,45,71
15	8.7	Numerical Integration	3,7,13,17,21
16	8.8	Improper Integrals	1,4,6,7,9,11,13,17,21,23,31,33
17	8.8	Improper Integrals	39,43,45,51,55,57,59,63,65,71,73

18	10.1	Sequences	3,7,9,15,17,21,23,35,39,41,45, 49,53,55
19	10.1/10.2	Finish Sequences; start Infinite Series	Section 10.1: 57,65,69,71,79,89,91, 97,99,109
20	10.2	Infinite Series	3,5,7,13,29,33,35,41,45,47,57,59,63, 65,69,77,79,98
21	10.3	Integral Test	3,6,9,13,15,21,27,29,31,33,35,37,55,57
22	10.4	Comparison Tests	1,5,18,19,21,23,25
23	10.4	Finish Comparison Tests; start Ratio and Root Tests	Section 10.4: 28,31,32,34,37,39,41, 47,51,58
24		**REVIEW FOR EXAM #2**	
25	10.5	Ratio and Root Tests	5,7,9,18,19,21,29,31,35,42,57,59,61,70
26	10.6	Alternating Series, Absolute vs. Conditional Convergence	5,7,9,10,11,13,15,19,21,23,25
27	10.6	Alternating Series, Absolute vs. Conditional Convergence	27,34,35,37,39,41,44,47,51,53,63,71,73
28	10.7	Power Series	3,5,9,11,15,19,23,27
29	10.7	Power Series	31,37,39,43,45,53,54
30	10.8	Taylor and Maclaurin Series	3,5,8,9,11,15,18,25,31,33,37
31	10.9	Convergence of Taylor Series	1,9,10,13,15,21,22,27
32	0.9/10.10	Finish Convergence of Taylor Series; start Binomial Series	Section 10.9: 31,39,41,43,45,47,53
33	10.10	Binomial Series and Applications of Taylor Series	1,3,5,13,23,25,29,31,35,39,45,49,55,61
34	11.1	Parametrizations of Plane Curves	1,3,5,7,9,16
35	11.1/11.2	Finish Parametrization of Plane Curves; start Calculus with Parametric Curves	Section 11.1: 29,31,35,37,43,49

36	11.2	Calculus with Parametric Curves	7,9,12,13,15,21,26,28,29,31,33,35
37	11.3	Polar Coordinates	1,5,7,13,17,23,27,32,37,47,51,59,60,61
38		**REVIEW FOR EXAM #3**	
39	11.4	Graphing in Polar Coordinates	1,5,6,17,29,31
40	11.5	Areas and Lengths in Polar Coordinates	1,7,11,15,17
41	11.5	Areas and Lengths in Polar Coordinates	21,23,27,28
42		**Review for Final**	
		FINAL EXAM	