MATH 112: Calculus II
Summer 2023 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 M. Potocki-Dul
Math 112-032	Professor R. Bouayad
Math 112-131	Professor M. Potocki-Dul

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: Please see the Summer 2023 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	20%
Midterm Exam I	25%
Midterm Exam II	25%
Final Exam	30%

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

A	88 - 100	**C**	65 - 71
B+	83 - 87	**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: 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 two common midterm exams held during the semester and one comprehensive common final exam. Exams are held on the following days:

Midterm Exam 1	June 14, 2023
Midterm Exam 2	July 19, 2023
Final Exam	August 7, 2023

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 2023 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 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/accessibility/

Important Dates (See: Summer 2023 Academic Calendar, Registrar)

Date	Day	Event

May 22, 2023	Monday	**Full, First, and Middle Summer** Session Begins
May 24, 2023	Wednesday	Last Day to Add/Drop for **First Summer** Session
May 26, 2023	Friday	Last Day to Add/Drop for **Middle Summer** Session
May 29, 2023	Monday	Last Day to Add/Drop for **Full Summer** Session
May 29, 2023	Monday	Memorial Day - University Closed/No Classes Scheduled
June 10, 2023	Saturday	Last Day to Withdraw from **First Summer** Session
June 16, 2023	Friday	Last Day to Withdraw from **Middle Summer** Session
June 16, 2023	Friday	Juneteenth - University Closed/No Classes Scheduled
June 26, 2023	Monday	Last Day of Classes for **First Summer** Session
June 30, 2023	Friday	Last Day to Withdraw from **Full Summer** Session
July 4, 2023	Tuesday	Independence Day - University Closed/No Classes Scheduled
July 5, 2023	Wednesday	**Second Summer** Session Begins
July 6, 2023	Thursday	Last Day to Add/Drop for **Second Summer** Session
July 17, 2023	Monday	Last Day of Classes for **Middle Summer** Session
July 20, 2023	Thursday	Last Day to Withdraw for **Second Summer** Session
August 8, 2023	Tuesday	Last Day of Classes for **Full and Second Summer** Session

Course Outline

Day #	Sect#	Subject Topic	Homework
1	5.6	*Review of Integration, u/du substitution*	*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, 57, 59*
2	6.1	*Volumes Using Cross Sections*	1,5,9,17,19,23,30,33,37, 41,45,47,49,51,53,55,59

3	6.2	*Volumes Using Cylindrical Shells*	3,5,9,11,17,19,21,25,29,33
	6.3	*Arc Length*	1,2,3,4,5,7,15,27
4	6.4	*Areas of Surfaces of Revolution*	9,13,15,17,19,21,24
4	6.5	*Work*	1,5,7,8,9,11,12,17,18,19,20
5	7.3	*Hyperbolic Functions*	2,7,9,15,17,21,23,43,45,47,49,53, 55, 57,81
6	8.1	*Using Basic Integration Formulas*	Section 8.1: 1,3,5,9,10,11,15,21,27,38
7	8.2	*Integration by Parts*	Section 8.2: 3,5,11,13,23,27,29,33,35,39,45,47, 59
8	8.3	*Trigonometric Integrals*	Section 8.3: 11,17,19,21,27,31,35,37,38,39,45, 65,71
9-10		*REVIEW FOR EXAM I* *EXAM I: 6/14/2023*	
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, 23,25,27,29,33,35,39,41,45,71
13	8.7	*Numerical Integration*	3,7,13,17,21,28
14	8.8	*Improper Integrals*	1,4,6,7,9,11,13,17,21,23,31,33
15	8.8	*Improper Integrals*	39,43,45,51,55,57,59,63,65,67,71,73
16	10.1	*Sequences*	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
17	10.2	*Infinite Series*	3,5,7,13,29,33,35,41,45,47,57,59,63,65,69,77,79,98
18	10.3	*Integral Test*	3,6,9,13,15,21,27,29,31,33,35,37
19	10.4	*Comparison Tests*	1,5,18,19,21,23,25, 28,31,32,34,37,39,41,43,47,51,58
20	10.5	*Root and Ratio Tests*	5,7,9,18,19,21,29,31,35,42,57,59,61,70
21	10.6	*Alternating Series, Absolute vs. Conditional Convergence*	5,7,9,10,11,13,15,19,21,23,25, 27,34,35,37,39,41,44,47,51,53,63,71,73
22	10.7	*Power Series*	3,5,9,11,15,19,21,23,27,31,37,39,43,45,53,54
23	10.8	*Taylor and McLaurin Series*	3,5,8,9,11,15,18,25,31,33,37
24		*REVIEW FOR EXAM II* *EXAM II: 7/19/2023*	
25	10.9	*Convergence of Taylor Series*	1,9,10,13,15,21,22,27,31,39,41,43,45,47,53
26	10.10	*Applications of Taylor Series*	1,3,5,13,23,25,29,31,35,39,45,49,55,61
27	11.1	Parametrizations of Plane Curves	1,3,5,7,9,16, 29,31,35,37,41,43,49
28	11.2	*Calculus with Parametric Curves*	7,9,12,13,15,21,26,28,29,31,33,35

29	11.3	*Polar Coordinates*	1,5,7,13,17,23,27,32,37,47,51,59,60,61
30	11.4	*Graphing in Polar Coordinates*	1,7,9,13,17,19,29,31
31	11.5	Areas and Lengths in Polar Coordinates	1,7,11,13,15,17, 21,23,27,28
32		*CATCH UP AND REVIEW*	
33		*FINAL EXAM*	

Updated by Professor M. Potocki-Dul - 04/21/2023
Department of Mathematical Sciences Course Syllabus, Summer 2023