MATH 112-H02: Calculus II - Honors
Spring 2021 Coordinated 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.

DMS Online Exam Policy Spring 2021: Exams will be proctored using both Respondus LockDown Browser+Monitor and Webex. Students will be required to join a Webex meeting from their phone with their cameras on, and to access the exam through LockDown Browser on a Mac or Windows PC with webcam. Students must follow all instructions related to environment checks and camera positioning.

Please be sure you read and fully understand our DMS Online Exam Policy.

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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 111H with a grade of B or better or Math 111 with a grade of A. Placement by performance on standardized entrance examinations.

Course-Section and Instructors

Course-Section	Instructor
Math 112-H02	Professor A. Bose

Office Hours for All Math Instructors: Spring 2021 Office Hours and Emails

Required Textbook:

Title	*Thomas' Calculus: Early Transcendentals*
Author	Hass, Heil, and Weir
Edition	14th
Publisher	Pearson
ISBN #	978-0134768496

University-wide Withdrawal Date: The last day to withdraw with a **W** is **Monday, April 5, 2021**. It will be strictly enforced.

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	17%
Midterm Exam I	17%
Midterm Exam II	17%
Midterm Exam III	17%
Final Exam	32%

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

A	85 - 100	C	65 - 69
B+	80 - 84	D	60 - 64
B	75 - 79	F	0 - 59
C+	70 - 74		

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. Students are expected to attend class. Each class is a learning experience that cannot be replicated through simply "getting the notes." This class will run in the synchronous online mode.

Homework Policy: 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. In addition to the online homework, there will be several problem sets to hand in.

MATLAB: MATLAB is a mathematical software program that is used throughout the science and engineering

curricula. Tutors are available to help students having difficulties in accordance with a posted **schedule**.

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

Midterm Exam I	February 10, 2021
Midterm Exam II	March 10, 2021
Midterm Exam III	April 21, 2021
Final Exam Period	May 7 - 13, 2021

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 and put away during all class times.

ADDITIONAL RESOURCES

Math Tutoring Center: Located in the Central King Building, Lower Level, Rm. G11 (See: Spring 2021 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 Chantonette Lyles, Associate Director of the Office of Accessibility Resources and Services at 973-596-5417 or via email at lyles@njit.edu. The office is located in Kupfrian Hall, Room 201. A Letter of Accommodation Eligibility from the Office of Accessibility Resources and Services 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 (OARS) website at:

- https://www.njit.edu/studentsuccess/accessibility/

Important Dates (See: Spring 2021 Academic Calendar, Registrar)

Date	Day	Event
January 19, 2021	T	First Day of Classes
January 23, 2021	S	Saturday Classes Begin
January 25, 2021	M	Last Day to Add/Drop Classes
March 14 - March 21, 2021	Su - Su	Spring Recess - No Classes
April, 2, 2021	F	Good Friday - No Classes
April 5, 2021	M	Last Day to Witdraw

May 4, 2021	T	Friday Classes Meet
May 4, 2021	T	Last Day of Classes
May 5 & May 6, 2021	W & R	Reading Days
May 7 - May 13, 2021	F - R	Final Exam Period

Course Outline

Lecture	Section	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	41,45,47,49,51,53,55,59
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 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: 3,5,11,13,23,27,29,33,35,37,39,45,47,59
10	8.3/8.4	Finish Trigonometric Integrals; start Trigonometric Substitution	Section 8.3: 7,9,11,17,19,21,27,31,35,37,38,39,45,65,71
11	8.4	Trigonometric Substitution	1,5,7,11,17,19,23,29,35,37,39,41,43,57
12		*REVIEW FOR EXAM #1*	
13	8.5	Integration of Rational Functions by Partial Fractions	3,7,9,13,14,16,17,19
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	3,7,13,17,21,28
16	8.8	Improper Integrals	1,4,6,7,9,11,13,17,21,23,31,33
17	8.8	Improper Integrals	39,43,45,51,55,57,59,63,65,67,71,73
18	10.1	Sequences	3,7,9,15,17,21,23,25,35,39,41,45,49,53,55
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		*REVIEW FOR EXAM #2*	
22	10.3	Integral Test	3,6,9,13,15,21,27,29,31,33,35,37,55,57
23	10.4	Comparison Tests	1,5,18,19,21,23,25
24	10.4	Finish Comparison Tests; start Ratio and Root Tests	Section 10.4: 28,31,32,34,37,39,41,43,47,51,58
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	3,5,9,11,15,19,21,23,27
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	10.9/10.10	Finish Convergence of Taylor Series; start Binomial Series	Section 10.9: 31,39,41,43,45,47,53
33	10.1	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		*REVIEW FOR EXAM #3*	
36	11.1/11.2	Finish Parametrization of Plane Curves; start Calculus with Parametric Curves	Section 11.1 29,31,35,37,41,43,49
37	11.2	Calculus with Parametric Curves	7,9,12,13,15,21,26,28,29,31,33,35
38	11.3	Polar Coordinates	1,5,7,13,17,23,27,32,37,47,51,59,60,61
39	11.4	Graphing in Polar Coordinates	1,7,9,13,17,19,29,31
40	11.5	Areas and Lengths in Polar Coordinates	1,7,11,13,15,17
41	11.5	Areas and Lengths in Polar Coordinates	21,23,27,28
42		*Review for Final*	
		FINAL EXAM	