

MATH 211: Calculus III A *Summer 2016 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 vectors, curvature, partial derivatives, multiple integrals, line integrals, and Green's theorem. Students who are considering a major in Mathematical Sciences or who are undecided about their major should take Math 213. This course is concerned with the development of calculus for functions of several variables. This includes the application of concepts from calculus to the study of curves and surfaces in space, and the study of 'vector fields' (an example of a vector field is the map of wind patterns often shown on the nightly news). The topics covered in this course are interesting as well as important, with numerous technological and scientific applications. Mastery of the material in this course will be critical if you go on to study classical dynamics (required for mechanical engineering or physics majors), electrodynamics (EE majors), fluid dynamics (chemical engineering majors), or a host of other topics in engineering and science. Many students find the material to be interesting although quite challenging; as a result it is likely that you will need to put more time into learning the material than is required for Math 111 and 112.

Number of Credits: 3

Prerequisites: Math 112 with a grade of C or better or Math 133 with a grade of C or better. Topics include vectors, curvature, partial derivatives, multiple integrals, line integrals, and Green's theorem. Students who are considering a major in Mathematical Sciences or who are undecided about their major should take Math 213. **EFFECTIVE FROM: FALL 2012**

Course-Section and Instructors

Course-Section	Instructor
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Math 211-041	Professor M. Michal
Math 211-141	Professor M. Michal

Required Textbook:

Title	<i>Thomas' Calculus: Early Transcendentals</i>
Author	Thomas
Edition	13th
Publisher	Pearson
ISBN #	978-0321981677
Notes	w/ MyMathLab access code

University-wide Withdrawal Date: Please note in either the calendar below or on the [2016 Summer Academic Calendar](#) for the last day to withdraw for each summer session.

COURSE GOALS

Course Objectives

- Apply previously developed skills learned in Calculus to learn Multivariable Calculus and Vectors.
- Cover Vectors, Partial Derivatives, Multiple Integrals and Vector Fields to prepare students for further study in technological disciplines and more advanced mathematics courses.
- Cover relevant applications in science and engineering to illustrate the utility of learning these topics.
- Use mathematical software, in problem solving, to allow the solution of more complex problems and provide visualization of the mathematical concepts in three dimensions.

Course Outcomes

- Prepare students for further study in technological disciplines and more advanced mathematics courses.
- Illustrate the utility of learning Multivariable Calculus to solve problems in engineering and the sciences.
- Demonstrate mastery of the topics covered by testing with common exams and 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	25%
Midterm Exam	35%

Your final letter grade will be based on the following tentative curve. **NOTE:** This course needs to be passed with a grade of C or better in order to proceed to Math 328, Math 331, Math 332, Math 335, Math 340.

A	87 - 100	C	60 - 66
B+	81 - 86	D	57 - 59
B	74 - 80	F	0 - 56
C+	67 - 73		

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 and Quiz Policy: The homework assignments are in the syllabus and online. In order to do the assignments you need to have a student access code. You can get an access code with a new book purchase that is bundled with My MathLab or by buying the code separately at the campus bookstore. If you buy a new book from another source make sure it is bundled with My MathLab. In addition on the first day of class your course instructor will give you an additional code needed to access the homework assignments. A quiz based on the homework problems will be given each week online or in class. There will be a short quiz every week on the material covered during the previous week. All of the quizzes will be graded. The homework and quizzes are intended to develop your problem-solving skills and to prepare you for the exams. The quiz and homework grades will be a significant component of your course grade.

How to Get Started with MyMathLab:

- http://m.njit.edu/Undergraduate/UG-Files/MML_Getting_Started.pdf
- http://m.njit.edu/Undergraduate/UG-Files/Technology_Tips.pdf

MATLAB Assignments: MATLAB is a mathematical software program that is used throughout the science and engineering curricula. Several MATLAB assignments will be given out. These assignments have been designed to help you learn how to use this software in order to visualize many of the concepts taught in class. Each MATLAB assignment will be graded and will be counted as a weekly quiz grade.

Class Preparation: Class preparation consists of written summaries of lectures handed in at the beginning of every class (together with homework). Students are responsible to read the section before the lecture and write one page summary consisted of definitions, theorems, and important examples.

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

Common Midterm Exam	June 22, 2016
Final Exam	July 18, 2016

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 EXAMS during the semester. In the event the Final Exam is not taken, under rare circumstances where the student has a legitimate reason for missing the final exam, a makeup exam will be administered by the math department. In any case the student must notify the Math Department Office and the Instructor that the exam will be missed and present written verifiable proof of the reason for missing the exam, e.g., a doctors note, police report, court notice, etc., clearly stating the date AND time of the mitigating problem.

ADDITIONAL RESOURCES

Math Tutoring Center: Located in Cullimore, Room 214 (See: [Summer 2016 Math Tutoring 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](#).

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

Important Dates (See: [Summer 2016 Academic Calendar, Registrar](#))

Date	Day	Event
May 23, 2016	M	All Summer Sessions Begin
May 24, 2016	T	Last Day to Register for All Summer Sessions
May 30, 2016	M	Memorial Day Holiday - University Closed
June 08, 2016	W	First and Middle Sessions Withdrawal Deadline
June 29, 2016	W	Full Summer Session Withdrawal Deadline
July 04, 2016	M	NJIT Closed for Independence Day Weekend
August 08, 2016	M	Full Summer Session Ends

Course Outline

Lecture	Section	Topic	Assignment
1	12.1-12.2	Three-Dimensional Coordinate Systems and Vectors	p.707: 13*,21*,27,43 p.716:10*,14,17*,28,34*,39,43,47*
2	12.3	The Dot Product	p.724:3*,12*,14,15,16,24,30,41*,44
3	12.4	The Cross Product	p.730:7*,17*,21,23,25,39*,45,48
4	12.5	Lines and Planes in Space	p.738:9*,17*,23*,27,29,35,48*,59,61,65*
5	12.6	Cylinders and Quadric Surfaces	p.744:5,8,11,15,19,22,33*,41*
	13.1	Curves in Space and Their Tangents	p.757:1,7*,9,14,15,21*,25
6	13.2	Integrals of Vector Functions; Projectile Motion	p.765:1*,7*,11,15*,17,21,32
	13.3	Arc Length in Space	p.745:1*,6,11,13*,15
7	14.1	Functions of Several Variables	p.799:5*,13,14,18,19,27,39,49*,53*,57,61
	14.3	Partial Derivatives	p.819:5*,17*,30*,43*,48,53*,61,65*,73,90
8	14.4	The Chain Rule	p.828:3*,5,7*,9,27*,29,35,37,43,48
9	14.5	Directional Derivative and Gradient Vectors	p.838:5*,9,11,15*,17,20*,27*,31,34
10	REVIEW FOR MIDTERM EXAM		
	MIDTERM EXAM: WEDNESDAY, JUNE 22		
11	14.6	Tangent Planes and Differentials	p.845:2,5*,9,15*,19,22,29*,41,43,51,53
12	14.7	Extreme Values and Saddle Points	p.855:3*,7,20*,27,31*,32,41,51,53*,57
13	14.8	Lagrange Multipliers	p.864:3*,8,13*,17,19*,22,25,30,35
14	15.1	Double and Iterated Integrals over Rectangles	p.858:3*,7,10,14,17,19*,23,27
15	15.2-15.3	Double Integrals over General Regions and Area by Double Integration	p.894:13*,18,35*,43,44*,47,51,57* p.899:3*,7,11*,21
16	15.4	Double Integrals in Polar Form	p.904: 10*,14*,17,21,23,29*,37*
17	15.5	Triple Integrals in Rectangular Coordinates	p.912:7,9*,11*,23*,25,31,33
18	15.6	Moments and Center of Mass	p.920:3*,4,13*,15,25*,29,33*
19	15.7	Triple Integrals in Cylindrical Coordinates (ONLY)	p.930:3*,7,9*,17*,18,52,53,55,59*
20	16.1	Line Integrals	p.955:9*,10,15,21*,24,29,34*
21	16.2	Vector Fields and Line Integrals: Work, Circulation, and Flux	p.967:9*,10,15*,19*,21,23*,24,27*,33,36
22	16.3	Path Independence, Conservative Fields, and Potential Functions	p.978:1*,7,9*,15*,19*,20,24,27*,29
23	16.4	Green's Theorem in the Plane	p.990:9*,11,13*,15,18*,19*,21,23*,25*,33
24	REVIEW FOR THE FINAL EXAM		

*Updated by Professor M. Michal - 5/21/2016
Department of Mathematical Sciences Course Syllabus, Summer 2016*
