

Fall 2019

MATH 213-003: Calculus III B

P. Ward

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MATH 213: Calculus III B

Fall 2019 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, surface integrals, and Green's, Divergence, and Stokes' theorems. Effective From: Fall 2012.

Number of Credits: 4

Prerequisites: Math 112 with a grade of C or better or Math 133 with a grade of C or better.

Course-Section and Instructors

| Course-Section | Instructor |
|----------------|-------------------------|
| Math 213-003 | Professor P. Ward |
| Math 213-005 | Professor I. Cohanoschi |
| Math 213-009 | Professor P. Ward |

Office Hours for All Math Instructors: [Fall 2019 Office Hours and Emails](#)

Required Textbook:

| | |
|-----------|--|
| Title | <i>Thomas' Calculus: Early Transcendentals</i> |
| Author | Hass, Heil, and Weir |
| Edition | 14th |
| Publisher | Pearson |
| ISBN # | 978-0134768496 |
| Notes | w/ MyMathLab |

University-wide Withdrawal Date: The last day to withdraw with a W is **Monday, November 11, 2019**. It will be strictly enforced.

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 | 10% |
| In-class Quizzes | 10% |
| Common Midterm Exams (3) | 50% |
| 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 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.

Quiz Policy: At least one 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

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:

| | |
|-------------------------|------------------------|
| Common Midterm Exam I | September 25, 2019 |
| Common Midterm Exam II | October 23, 2019 |
| Common Midterm Exam III | November 20, 2019 |
| Final Exam Period | December 14 - 20, 2019 |

The time of the midterm exams is **4:15-5:40 PM** for daytime students and **5:45-7:10 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

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: **Fall 2019 Hours**)

Accommodation of Disabilities: Disability Support Services (DSS) 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 Disability Support Services at **973-596-5417** or via email at lyles@njit.edu. The office is located in Fenster Hall Room 260. A Letter of Accommodation Eligibility from the Disability Support 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 Disability Support Services (DSS) website at:

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

Important Dates (See: **Fall 2019 Academic Calendar, Registrar**)

| Date | Day | Event |
|--------------------------------|--------|------------------------------|
| September 3, 2019 | T | First Day of Classes |
| September 13, 2019 | M | Last Day to Add/Drop Classes |
| November 11, 2019 | M | Last Day to Withdraw |
| November 26, 2019 | T | Thursday Classes Meet |
| November 27, 2019 | W | Friday Classes Meet |
| November 28 - December 1, 2019 | R - Su | Thanksgiving Recess |
| December 11, 2019 | W | Last Day of Classes |
| December 12 & 13, 2019 | R & F | Reading Days |
| December 14 - 20, 2019 | Sa - F | Final Exam Period |

Course Outline

The placement of Common Exams within the Topic list below is meant to provide a rough estimate of material that will appear on the exam. The precise set of sections to be tested on for each Common Exam will be provided by the course instructor on the Friday preceding the exam.

| Sections | Topic |
|---|---|
| 12.1-12.2 | Three-Dimensional Coordinate Systems, Vectors |
| 12.3-12.4 | The Dot Product, the Cross Product |
| 12.4-12.5 | The Cross Product, Lines and Planes in Space |
| 12.5-12.6 | Lines and Planes in Space, Cylinders and Quadric Surfaces |
| 12.6 | Cylinders and Quadric Surfaces |
| 13.1 | Curves in Space and Their Tangents |
| 13.2 | Integrals of Vector Functions; Projectile Motion |
| 13.3 | Arc Length in Space |
| 13.4 | Curvature and Normal Vectors |
| 14.1 | Functions of Several Variables |
| COMMON EXAM 1: WEDNESDAY, SEPTEMBER 25, 2019 | |
| 14.2-14.3 | Limits and Continuity in higher Dimensions, Partial Derivatives |
| 14.3 | Partial Derivatives |
| 14.4-14.5 | The Chain Rule, Directional Derivatives and Gradient Vectors |
| 14.5-14.6 | Directional Derivative and Gradient Vectors, Tangent Planes and Differentials |
| 14.7 | Extreme Values and Saddle Points |
| 14.8 | Lagrange Multipliers |
| 14.8-14.9 | Lagrange Multipliers, Taylor's Formula in Two Variables |
| 15.1 | Double and Iterated Integrals over Rectangles |
| 15.2 | Double Integrals over General Regions |
| 15.3 | Area by Double Integration |
| 15.4 | Double Integrals in Polar Form |
| 15.5 | Triple Integrals in Rectangular Coordinates |
| COMMON EXAM 2: WEDNESDAY, OCTOBER 23, 2019 | |
| 15.7 | Triple Integrals in Cylindrical and Spherical Coordinates |
| 15.8 | Substitutions in Multiple Integrals |
| 15.8 | Substitutions in Multiple Integrals |
| 16.1 | Line Integrals |
| 16.1-16.2 | Line Integrals, Vector Fields and Line Integrals: Work, Circulation, and Flux |
| 16.2 | Vector Fields and Line Integrals: Work, Circulation, and Flux |
| 16.3 | Path Independence, Conservative Fields, and Potential Functions |
| 16.3 | Path Independence, Conservative Fields, and Potential Functions |

| | |
|------|---|
| 16.4 | Greens Theorem in the Plane |
| 16.4 | Greens Theorem in the Plane |
| 16.5 | Surfaces and Area |
| 16.5 | Surfaces and Area |
| | Common Exam 3: Wednesday, November 20, 2018 |
| 16.6 | Surface Integrals |
| 16.6 | Surface Integrals |
| 16.7 | Stokes Theorem |
| 16.7 | Stokes Theorem |
| 16.8 | The Divergence Theorem |
| 16.8 | The Divergence Theorem |
| | FINAL EXAM REVIEW |

*Updated by Professor A. Bose 8/19/2019
Department of Mathematical Sciences Course Syllabus, Fall 2019*
