

# Math 223 Section 5635 - Calculus III

## Fall 2005

**Professor:** Dr. Jess Lenarz

**Meeting Time & Place:** 1:20 pm - 2:30 pm MWF, Ivers 218

**Office:** Ivers 234E

**Office Hours:** Monday & Wednesday 2:30-4:00,  
Tuesday 10:30-12:00, 1:30-3:00;  
other times by discovery or appointment

**Phone:** 299-3347

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**Website:** TBA

**Text:** *Calculus, Early Transcendentals*, 5<sup>th</sup> ed. by James Stewart. We will cover Chapters 12-16.

### Course Objectives:

- Review and (re)learn the fundamentals of single variable calculus.
- Study the concept of vectors and their operations.
- Understand the concept of vector functions and apply calculus to these functions.
- Study multi-variable functions and generalize the concepts of differential calculus to these functions.
- Generalize the concepts of integral calculus to multi-variable functions including double and triple integrals.
- Study vector fields and generalize the concepts of calculus over scalar fields.
- To prepare the student for courses that have Calculus III as a prerequisite.

**Free Tutoring:** The Academic Enhancement center (AEC) in Lower Level Fjelstad has Math tutors Monday through Thursday 3 pm to 5 pm and 7 pm to 9 pm, and Sunday night 7 pm to 9 pm. For more information visit the AEC homepage:

<http://student.cord.edu/dept/aec/index.shtml>

**Grading:** Final grades will be determined by the following components:

Component	%	Date
HW/Quizzes	15 %	Every class
Exam 1	20 %	October 5
Exam 2	20 %	October 28
Exam 3	20 %	November 23
Project	5 %	December 2
Final Exam	20 %	December 14

Grades will be based on the following scale:

Percentage	Grade	Percentage	Grade
93-100	A	73-76	C
90-92	A-	70-72	C-
87-89	B+	67-69	D+
83-86	B	63-66	D
80-82	B-	60-62	D-
77-79	C+	0-59	F

**Quizzes & Homework:** Suggested homework problems for each section are listed below. The answers to all odd-numbered problems are in the back of the book. I encourage you to work together outside of class. Every class period (except exam days) will begin with a quiz on the section from the previous lecture or the collection of problems assigned last class period.

**Project:** There will be a project assigned later in the semester. The goal of this project is to solve a problem by integrating the techniques learned throughout the semester and present your solution in a clear and concise paper (i.e., you will describe your solution not only with symbols but with words...). More information will be provided soon.

**Exams:** There will be 3 in-class exams given during the course as well as a comprehensive final exam. Each in-class exam will be 70 minutes long. Attendance is required for exams. If you can not attend for some reason, you must contact me **before** the exam to schedule a makeup exam.

**Academic Integrity:** All students are expected to follow the policies set forth in the Academic Integrity section of the catalog. Cheating will NOT be tolerated. If you are caught cheating, you will receive a zero for that quiz, exam or assignment.

**Calculators:** Calculators will be prohibited for certain quizzes or exams. You may use a calculator at any other time, but exams will be written in such a way that a calculator gives

no unfair advantage.

**Partial Credit:** Partial credit will be awarded. If your final answer is incorrect, but your thought processes were correct in general, you will receive some credit. In a similar manner, if no thought processes are indicated and your answer is correct, you will not receive full credit. **YOU MUST ALWAYS SHOW YOUR WORK!**

**Attendance:** Students are expected to attend and participate in class. If you aren't in class, you won't learn anything! If you must miss class due to illness, please call me and let me know. If you must miss class due to a college sponsored activity, please notify me in advance. You may be required to do makeup work for the time you are gone. A general rule of thumb is no more than three absences.

**Classroom Behavior:** Please respect your fellow classmates. This means not distracting other students during class with ringing cell phones, talking on the phone, talking with your neighbor, etc. I do not mind if you eat or drink during class, just clean up after yourself.

**Late Policy & Makeup Exams:** Makeup quizzes or exams will only be given for excused absences. An excused absence is one due to illness, college sponsored activities, or a special situation discussed with me. I must be notified ahead of time for all excused absences. The only exceptions are illness and emergencies, in which case I must be notified as soon as possible. Late homework will not be excepted except in special circumstances (illness or emergencies).

**Changes:** Components of this syllabus are subject to change. If changes need to be made in the syllabus, students will be involved in the decision process.

#### Tentative Daily Schedule and Suggested Problems:

Date	Section	Exercises
Sept. 2	12.1 - 3-D Coordinates	p. 797 4,8,9a,10,11,16,20,21,24,28,30,32-36,40,41
Sept. 5	12.2 - Vectors	p. 805 2,4,8,11,13,15,18,22,25,26,29,30,36,37,43
Sept. 7	12.3 - Dot Product	p. 812 1,7,9,12,19,22,24-27,45,47,51,56,59
Sept. 9	12.4 - Cross Product	p. 820 9-14,16,26,29,32,39b,41,45
Sept. 12	Fall Symposium	No Class
Sept. 14	12.5 - Equations of Lines & Planes	p. 829 4,5,7,10-14,26,29,30,31,34,39
Sept. 16	12.6 - Quadric Surfaces	p. 837 1,5,7,32,33,35,36,41-46
Sept. 19	12.7 - Cylindrical & Spherical Coordinates	p. 842 3,11,13,17,19,21,37-47 odd, 49,51,52,54,57,60,68
Sept. 21	13.1 - Vector Functions	p. 855 1,2,4,5,8-10,14,17,26,40
Sept. 23	13.2 - Derivatives & Integrals	p. 861 5,6,8,12-15,18,25,26,32,34-37,40,47,49
Sept. 26	13.3 - Arc Length	p. 868 2,3,4,6
Sept. 28	13.4 - Motion in Space	p. 878 5,6,7,14,17,19,20
Sept. 30	14.1 - Functions of Several Variables	p. 897 2,6,8,11,12,15,21,22,25,26,36,38,40
	14.2 - Limits & Continuity	p. 908 6,7,8,12,13,15,28,30,31,34,35

Date	Section	Exercises
Oct. 3	Review	
Oct. 5	Exam 1 (Chapters 12 & 13)	
Oct. 7	14.3 - Partial Derivatives	p. 919 5,6,9,14,21,22,24,28,30,36,37,44,57,62,78
Oct. 10	14.4 - *Linear Approximations	p. 930 3,6,12,15,17,19,26,29,34,36
Oct. 12	14.5 - Chain Rule	p. 938 3,5,9,11,13,14,15,17,19,23,25, 39, 41,44,49
Oct. 14	14.6 - Directional Derivatives	p. 950 5,9,18,19,20,22,25,28,29,31,32,35,37b, 38,43,44,48,52,53
Oct. 17	14.7 - Maximum & Minimum Values	p. 961 1,3,10,14,39,45,46
Oct. 19	14.8 - Lagrange Multipliers	p. 970 1,3,7,27,33,34
Oct. 21	Midterm Break	No Class
Oct. 24	Review	
Oct. 26	Exam 2 (Chapter 14)	
Oct. 28	15.1 - Double Integrals 15.2 - Iterated Integrals	p. 994 2,5,6,11,12,15,18,21,22,29
Oct. 31	15.3 - Double Integrals over General Regions	p. 1002 3,5,14,18,23,27,35,38,40,41,44,46,54
Nov. 2	15.4 - Double Integrals in Polar Coordinates	p. 1008 8,11,16,19,20,22,24,26,29,32,35
Nov. 4	15.5 - Applications	p. 1018 23-26,27a
Nov. 7	15.6 - *Surface Integrals	p. 1022 1-7 odd, 23
Nov. 9	15.7 - Triple Integrals	p. 1030 5,6,15,18,25,26,31,45,46
Nov. 11	15.8 - Triple Integrals in Cylindrical & Spherical Coordinates	p. 1037 1,3,5,7,12,19,20,24,33,35
Nov. 14	Review	
Nov. 16	Exam 3 (Chapter 15)	
Nov. 18	16.1 - Vector Fields	p. 1060 1,2,11-18,21,23
Nov. 21	16.2 - Line Integrals	p. 1071 1,5,11,15,19,37,38
Nov. 23	16.3 - The Fundamental Theorem for Line Integrals	p. 1081 3,4,6,7,13,15,19,21
Nov. 25	Thanksgiving Break	No Class
Nov. 28	16.4 - Green's Theorem	p. 1089 1,7,9,13,15
Nov. 30	16.5 - Curl & Divergence	p. 1096 1,3,5,9,12,13,15,25,26
Dec. 2	16.6 - Parametric Surfaces	p. 1106 1,3,11-16,17,19,35,37
Dec. 5	16.7 - Surface Integrals	p. 1119 5,7,9,19,21,23
Dec. 7	16.8 - *Stoke's Theorem	p. 1125 2,3,7,8
Dec. 9	16.9 - Divergence Theorem	p. 1132 3,5,7,8,20,25
Dec. 12	Review	
Dec. 14	Final Exam	Wednesday 8:30-10:30

\*Time permitting