

**Prerequisites:** A grade of C or better in MA 152 Calculus II, or the equivalent.

**Instructor:** George Voutsadakis  
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**Office Hours:**

Monday	Tuesday	Wednesday	Thursday	Friday
9-9:50 a.m.	9-9:50 a.m.	8-8:50 a.m.	9-9:50 a.m.	9-9:50 a.m.

**Required Texts:** Essential Calculus: Early Transcendentals, by James Stewart, Brooks Cole, 1<sup>st</sup> edition, ISBN: 0495109576, 2006.

**Course Description:** In this course we cover analytical geometry, three-dimensional space, vectors, calculus of vector-valued functions, partial derivatives, and multiple integrals.

**Course Goals:** Provide students with an introduction to multi-dimensional calculus.

**Course Objectives:** At the conclusion of MATH251 students will be able to:

1. Recognize standard equations of three dimensional surfaces in rectangular, cylindrical, and spherical coordinates; describe and sketch their graphs and traces; and find the equations of spheres, lines and planes.
2. Apply 2- and 3-dimensional vector arithmetic including dot and cross products and projections; compute vector length; analyze vector-valued functions to find tangents, normals, and binormals; and determine arc length and curvature.
3. Compute partial derivatives of functions of two or more variables; and apply partial derivatives to gradients, directional derivatives, and approximation and optimization problems.
4. Compute double and triple integrals in rectangular, cylindrical, and polar coordinates; identify when to use each coordinate system; and translate from one system to the other.
5. Create and solve mathematical models involving area, volume, mass, moments, work, and optimal design, using dimensional analysis, vectors, partial derivatives or multiple integrals.



# LAKE SUPERIOR STATE UNIVERSITY

College of Natural & Mathematical Sciences

MATH 251 Calculus III (4,0)

Spring 2014

4 Credits

## Grading Scale and Policies:

**Point Values:** There will be around 10 quizzes during the semester. The dates will not be fixed in advance. This means that they will be unannounced and it will be your responsibility to be covering the relevant homework problems on time along with the coverage of the corresponding sections during class time. Each quiz will be worth 10 points approximately for a total of 100 points. Your overall grade will be complemented by 4 in-class 50 minute exams and a final exam as follows:

Quizzes	100 points
Tests (4 worth 50 points each)	200 points
Final Exam	100 points
<b>Total</b>	<b>400 points</b>

You will be graded on correct methodology. This means that if you provide an answer but show no work or your work is incorrect, you will not receive credit. Your solutions must be written in a connected, step-by-step logical fashion and all variables should be clearly defined. If your solution is not written clearly, you will not receive full credit. In many cases, setting up the correct mathematical formula and using proper mathematical procedures and notation while solving a problem will be just as important as computing a numeric answer.

## Grading Scale %:

94-100	A	70-74	C
90-93	A-	65-69	C-
87-89	B+	60-64	D+
84-86	B	55-59	D
80-83	B-	50-54	D-
75-79	C+	0-49	F

## Ground Rules:

- 1. Calculator:** The TI-83/84 Plus is the recommended calculator for this course. Your instructor reserves the right to ask you to solve some/all problems in some/all assignments/exams etc. without using calculators depending on the nature of the work assigned. All other electronic devices, including computers, PDAs and cell phones, must be turned off for all class lecture sessions.
- 2. Purpose of Lecture:** Class sessions are an opportunity for you to ask questions and seek clarification on material and for the instructor to present new material. To get the most out of meetings, you should prepare by doing the assigned homework from the previous meeting and reading the next section.
- 3. Attendance Policy:** Attendance is strongly encouraged, since participation constitutes 40% of your final grade. If you miss a class, or are late, you are still responsible for class notes and assignments. Attendance and class activities will affect your final grade.



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**4. Make-up Policy:** Each exam should be taken at the designated time. In the event of a schedule conflict with a university function, dental/physician's appointment, or an emergency, you must notify me in advance and arrange to take a make-up test as early as possible. **NO make-up exams will be allowed for unexcused or insufficiently documented absences. I WILL BE STRICTLY ENFORCING THIS POLICY FOR ALL.**

**5. Academic Integrity:** Students are expected to perform all assigned work themselves. Working on homework assignments with one or more classmates is a great way to learn. However, you should always write up your own solution, without the aid of another person or another person's solution unless explicitly authorized to the contrary. Any form of cheating or plagiarism will be handled in accordance with the Academic Integrity Procedures. Violations of the *University Academic Integrity Policy* may result in an F for the course grade and/or further disciplinary action as required by university policies and procedures.

**6. Testing:** Use of head phones, cell phones and hats during exams is prohibited.

**University Policies and Statements:**

**Online and Blended Course Attendance Policy**

Students in online or blended classes are required to log in to the Course Management System (Blackboard, Wimba, TaskStream, etc.) and complete at least one "Academic Related Activity" within the Add/Drop period.

**The Americans with Disabilities Act & Accommodations**

In compliance with Lake Superior State University policies and equal access laws, disability-related accommodations or services are available to students with documented disabilities.

If you are a student with a disability and you think you may require accommodations you must register with Disability Services (DS), which is located in the KJS Library, Room 130, (906) 635-2355 or x2355 on campus. DS will provide you with a letter of confirmation of your verified disability and authorize recommended accommodations. This authorization must be presented to your instructor before any accommodations can be made.

Students who desire such services should meet with instructors in a timely manner, preferably during the first week of class, to discuss individual disability related needs. Any student who feels that an accommodation is needed – based on the impact of a disability – should meet with instructors privately to discuss specific needs.

**IPASS (Individual Plan for Academic Student Success)**

If at mid-term your grades reflect that you are at risk for failing some or all of your classes, you will be contacted by a representative of IPASS. The IPASS program is designed to help you gain control over your learning through pro-active communication and goal-setting, the development of intentional learning skills and study habits, and personal accountability. You may contact 635-2887 or email [ipass@lssu.edu](mailto:ipass@lssu.edu) if you would like to sign up early in the semester or if you have any questions or concerns.

**Tentative Course Outline**

Week	Dates	Monday	Tuesday	Thursday	Friday
1	01/13	9.1	9.2	9.3	9.4
2	01/20	9.5	10.1	10.2	10.3
3	01/27	10.3	10.4	10.4	10.5
4	02/03	10.5	10.6	10.6	Exam 1
5	02/10	10.7	10.7	10.8	10.8
6	02/17	10.9	11.1	11.1	11.2
7	02/24	11.2	11.3	11.3	Exam 2
8	03/03	BREAK	BREAK	BREAK	BREAK
9	03/10	11.4	11.4	11.5	11.6
10	03/17	11.6	11.7	11.7	11.8
11	03/24	11.8	12.1	12.1	Exam 3
12	03/31	12.2	12.2	12.3	12.3
13	04/07	12.4	12.4	12.5	12.5
14	04/14	12.6	12.6	12.7	Exam 4
15	04/21	12.7	12.8	Review	Review

**Assignments (Subject to possible change):** *Please do these assigned exercises as soon as you possibly can after lecture, because this is your best way to reinforce your learning. If you cannot complete all the problems, do at least one from each group (one of each type).*

### Assignments

Section	Exercises	Section	Exercises
9.1	1, 2, 3, 5, 7, 10, 13, 15, 17, 27	10.9	5, 6, 9, 10, 12, 15, 18, 24, 26, 29, 31
9.2	3, 5, 13, 15, 21, 25, 27, 28, 37, 40	11.1	2, 4, 7, 9, 15, 16, 17, 25, 27, 29, 47, 49
9.3	13, 14, 19, 20, 29, 33, 39, 49, 50, 51, 53	11.2	3, 5, 9, 15, 21, 25, 27, 29
9.4	3, 9, 12, 15, 17, 19, 21, 25, 33, 35	11.3	5, 8, 9, 15, 16, 19, 25, 29, 31, 37, 39, 43, 44, 47, 51, 53, 55, 57, 59, 64, 71, 73
6.1	9, 15, 17, 19, 30, 31, 33	11.4	1, 3, 5, 11, 13, 17, 19, 21, 25, 27
6.2	11, 15, 25, 28, 35, 37, 39	11.5	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 22, 23, 25, 27, 37, 39
6.3	11, 17, 25, 27, 28, 35, 36, 37, 41	11.6	1, 2, 3, 5, 7, 9, 13, 15, 17, 19, 20, 21, 31, 33, 37, 41, 42, 43
9.5	1, 3, 5, 11, 13, 15	11.7	3, 5, 7, 9, 11, 23, 25, 27, 31, 33, 35, 37
10.1	6, 8, 9, 10, 11, 13, 19, 30, 35, 36	11.8	1, 3, 5, 7, 17, 19, 23 (38, 39)
10.2	7, 9, 12, 13, 15, 17, 20, 21, 23, 24	12.1	3, 9, 11, 13, 15, 17, 21, 23, 29, 31
10.3	1, 6, 8, 15, 17, 19, 21, 25, 26, 31, 33	12.2	3, 5, 6, 7, 9, 11, 15, 17, 19, 23, 31, 35, 37, 41
10.4	5, 6, 9, 12, 15, 18, 23, 25, 27, 29, 31, 41	12.3	9, 11, 13, 15, 17, 23, 25, 27
10.5	2, 5, 6, 8, 10, 12, 14, 15, 17, 19, 21, 23, 25, 29, 31, 33, 35, 37, 39, 41, 45, 47, 49	12.5	2, 3, 5, 7, 9, 11, 17, 19, 21, 25
10.6	3, 8, 11, 15, 21, 25, 28, 29, 30, 31	12.6	3, 9, 11, 15, 17, 19, 21, 27
10.7	1, 2, 7, 11, 15, 23, 25, 29, 34, 36, 38, 41, 43, 45, 49, 51, 55, 57, 59, 61	12.7	1, 5, 9, 11, 13, 15, 17, 21, 23, 25, 26
10.8	1, 3, 7, 11, 13, 15, 17, 21, 35, 36, 37, 38		