

Instructor: Xingru Zhang

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Lectures: TuTh 12:30 pm – 1:50 pm in Nsc 216

Office Hours: TuTh 2:00 pm – 3:30 pm in MATH 111.

Recitations: (begin in the second week of classes)

MTH241LR-X1 Tu 5:00 pm – 5:50 pm in Bell 138;

MTH241LR-X2 Th 5:00 pm – 5:50 pm in Bell138;

MTH241LR-X3 Th 11:00 am – 11:50 am in Obrian 214.

Math Help Center:

9:00 am – 4:00 pm weekdays in MATH 110.

Textbook: Calculus: Early Transcendentals Multi Variable, by James Stewart, 8th custom UB ed. (8th custom UB edition consists of chapters 12 – 16 of the standard 8th edition of James Stewart, Calculus: Early Transcendentals.)

Students can buy the textbook bundles (\$122.50) from the UB bookstore or buy the ebook bundle (\$33) online from the following website:

<http://www.cengagebrain.com/course/2826136>

Prerequisite: MTH 142 with recommended grade of C or higher; MTH 121-122 is usually not adequate preparation for MTH241.

Course Description and Material to Be Covered:

This is the third part of a 3-semester sequence in calculus for students of mathematics, natural sciences and engineering, in which we study differentiation and integration of functions of several variables. We will cover all sections of the book except for 15.10.

Online Homework: Homework assignments will be given regularly (almost every week) on the web site: <http://www.webassign.net>

You need to complete and submit each assignment on Webassign before its due date. You need to create an account there right away. **Your initial login Classkey is: buffalo 9395 1319.** You will also need a access code (which is already included in your textbook bundle or e-book bundle).

Among all your homework scores, I will drop one lowest and use the average of the rest as your final homework score. No late homework will be accepted unless you have a valid documented excuse.

Exams: There will be three midterm exams given in class. They are tentatively scheduled on Sept. 25, Oct. 30 and Dec. 7. There will be **no Final Exam** given during the final exam period. On exams, books or calculators or any electronic devices are prohibited, but each student may bring in one 3" × 5" index card written both sides with any information. ID's will be checked at each exam.

Absence from Examination: If absence is due to illness, I require a note from a doctor indicating that you were under care at the time of the exam. If absence is due to a family emergency, I require a letter from a parent, signed with the name, date, phone #, and address, mailed directly to me at the Mathematics Department. In any case you need to notify me (by phone or your UB

email) before the exam is given. The penalty for an absence not excused is a grade of 0 for the exam missed. Note that a makeup exam is usually much harder to do.

Grading Scheme: Based on the total of 100 points, your final homework score, exam 1 score, exam 2 score and exam 3 score will count 15%, 25%, 30% and 30% respectively. Cutoffs for the final course letter grades are as follows:

92-100 points–*A*, 88-91 points–*A*_–, 85-87 points–*B*₊, 79-84 points–*B*, 76-78 points–*B*_–, 73-75 points–*C*₊, 67-72 points–*C*, 64-66 points–*C*_–, 60-63 points–*D*₊, 55-59 points–*D*, 0-54 points–*F*.

I reserve the right to modify these cutoffs if circumstances warrant.

Controlled Enrollment: This is a Controlled Enrollment Course. If you need to repeat this course in the future (because you failed it, resigned from it etc. at the first attempt) you may be forced to do it in a UB summer session. Registering to repeat this course in a Fall or Spring semester may be difficult or impossible. For more information see the Repeat Policy in the UB Undergraduate Catalog: <http://undergrad-catalog.buffalo.edu/policies/grading/repeat.shtml>

Academic Honesty: You are expected to conduct yourself with integrity in this course. Cheating will be dealt with as harshly as University regulations permit.

Students with Disabilities: Students with disabilities who may need special accommodations should contact the Accessibility Resources Office (25 Capen Hall, ph. 716-645-2608) that will determine the appropriate arrangements.

Use of UBlearns

I will use UBlearns to post announcements (which will be send to your UB email account at the same time), review problems for exams, solutions to review problems, all exam grades, final homework grades, final percentage grades and final letter grades.

Student Learning Outcomes:

The list below indicates to what extent this course reflects each of the learning objectives of the undergraduate mathematics program. A description of learning objectives is available online at http://www.math.buffalo.edu/undergraduate/undergrad_programs.shtml.

- **Computational Skills:** extensively
- **Analytical Skills:** little or not at all
- **Practical Problem Solving:** moderately
- **Research Skills:** little or not at all
- **Communication Skills:** little or not at all

At the end of this course a student will be able to:	Assessment:
<p>understand vectors in two and three dimensional space and their geometric interpretation, add vectors and multiply vectors by scalars, compute dot product and cross product of two vectors and understand the properties of these operations, compute vector projection and scalar projection of one vector onto another, compute the area of a parallelogram or the volume of a parallelepiped, write equations of lines and planes in the three dimensional space, compute distance between a point and a line or between a point and a plane or between two lines or between two planes, compute velocity and acceleration of a space curve and vice versa find the space curve given acceleration or velocity with some initial conditions, compute the unit tangent vector, the normal vector, the binormal vector, the curvature, the tangent line equation, the normal plane equation, the osculating plane equation, the osculating circle, the normal and tangential components of the acceleration of a space curve,</p>	<p>HW 1-4 Midterm 1</p>
<p>compute limit of a function of two variables at a point, verify continuity of functions of two variables, compute partial derivatives of a function of several variables, apply the chain rule to compute partial derivatives, compute directional derivatives and the gradient of a function and understand the meaning of these notions, write an equation of the tangent plane to the graph of a function of two variables and interpret it as a linear approximation of the function, compute critical points of a function of two variables, use the second derivative test to classify critical points of a function of two variables into local minima, local maxima, and saddle points and understand the geometrical interpretation of this classification, use the method of Lagrange multipliers to solve constrained optimization problems in two and three variables, compute integrals of functions of two variables over regions of the xy-plane using cartesian and polar coordinates,</p>	<p>HW 5-8 Midterm 2</p>
<p>apply double integrals to compute mass and center of mass of lamina, and to compute surface areas, compute triple integrals using cartesian, cylindrical, and spherical coordinates, compute line integrals, directly, using the fundamental theorem for line integrals, and using Greens theorem, compute curl and divergence of a vector field, verify if a vector field is conservative and when it is, find a potential function for it, compute surface integrals, directly, using Stokes theorem, and using the divergence theorem.</p>	<p>HW 9-12 Midterm 3</p>