Math 240/242, Section 02 **MWF 2-2:50 pm W 1-1:50 pm, W01-0042**

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Math 240/242—Multivariable and/or Vectorial Calculus Syllabus for Section 02

Spring 2023

General Course Procedures and Information

Catalog Description

Differential and integral calculus of functions of several variables and of vector fields. Topics include Euclidean, polar, cylindrical, and spherical coordinates; dot product, cross-product, equations of lines and planes; continuity, partial derivatives, directional derivatives, optimization in several variables; multiple integrals, iterated integrals, change of coordinates, Jacobians, general substitution rule; curves and surfaces, parametrizations, line integrals, surface integrals; gradient, circulation, flux divergence; conservative, solenoidal vector fields; scalar, vector potential; Green, Gauss, and Stokes theorems. Please note: Because MATH 242 is the final part of a three-semester calculus sequence, it should be taken as soon as possible after MATH 141.

Grading Policies

Letter grades are assigned as follows:

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

The course grade will be calculated according to the percentages below:

Webwork Average	12%
Written Assignments Average	5%
Quiz Average	18%
In-class Exam	30%
Final Exam	35%

Expectations

The purpose of this section is to clearly present to you what the Mathematics Department must expect of students in support of their own success, and of the essential ways in which the Department expects instructors to support your success. Please review the lists below, and **come back to this section if you ever feel confused about how to improve your performance in your current math class.**

You may find these expectations shocking, but it is the sober consensus of a large number of experts that success in university-level mathematics courses is not possible unless students commit to the following:

1. Attend all classes and take good notes.
2. Spend 10–15 hours per week outside of class reading, studying, doing homework, and working additional practice problems of your own choosing, until you have achieved thorough mastery of concepts and high accuracy and fluency in computation.

   (This is not a typographical error or a mistake. Mathematics is a unique subject which requires more study and practice to achieve mastery than many other subjects. You would not expect to master the use of a musical instrument without considerable time spent practicing, and you should think of Mathematics in much the same way. This subject is foundational to many other subjects, especially in science and technology, and time spent achieving thorough mastery will have a very high return on investment.)
3. Thoroughly review lecture notes until knowledge gaps are filled.
4. Work on problems outside of class and do more problems than assigned for homework, again referring to the lecture notes when knowledge gaps arise.
5. Take responsibility for thorough mastery by asking questions in class and/or seeking extra help whenever this is necessary.

In return, students should expect instructors to support their learning in the following ways:

1. Clearly communicate the objectives of the course.
2. Distribute the syllabus.
3. Clearly communicate the due dates of homework assignments and the dates of exams.
4. Return graded work in a timely fashion, normally within two weeks of its due date.
5. Clearly identify the study resources (textbook, tutoring, etc.) available to students and appropriate for their use in this course.

Approaching the course with these expectations in mind will dramatically improve your likelihood of success in this course.

Taffee Tanimoto Mathematics Resource Center

The Mathematics Department maintains a free drop-in help center for students in this course. Staff at the Tanimoto Center are familiar with the Edfinity and WeBWorK homework platforms and can provide technical assistance in using these systems. In addition, the Center provides mathematics subject tutoring for this course. Please see

https://www.umb.edu/academics/csm/mathematics#tanimoto_center

for the Center's current location and opening hours.

Student Conduct

Students are required to adhere to the University Policy on Academic Standards and Cheating, to the University Statement on Plagiarism and the Documentation of Written Work, and to the Code of Student Conduct. The section of the Code pertaining to academic honesty is available online at the following URL:

https://www.umb.edu/editor_uploads/images/life_on_campus/FINALUMBCode9-5-18-Appendix_B_V2.pdf

Violation of these policies will result in disciplinary action, as described in section B.II of the Code.

Academic Integrity Guidelines

Students may discuss how to solve written assignments and Webwork with their classmates prior to the due date. However, when entering your answers online you are indicate you are able to solve the problem on your own if asked. Do not randomly enter answers until you get the right one! The written assignment submission must be in your own words. Any submissions that are direct copies of others will not be accepted, this includes solutions that may be found online. It is up to the instructor whether or not you may resubmit the assignment. Always ask before submitting an assignment after the due date has passed.
Quizzes, tests, and exams must be solved on your own, without assistance from any other sources. Any indication that you received assistance prior or during the quiz or exam will result in a zero on the assignment. A repeat offense will result in a failing grade for the course.

Accommodations for Students with Disabilities

Section 504 of the Americans with Disabilities Act of 1990 offers guidelines for curriculum modifications and adaptations for students with documented disabilities. If applicable, students may obtain adaptation recommendations from the Ross Center for Disability Services, CC-UL-211, (617-287-7430). The student must present these recommendations and discuss them with each professor within a reasonable period, preferably by the end of the Drop/Add period.

Complaint Procedure

If issues arise regarding the design of this course or the conduct of the instructor, the proper complaint procedure is to first make a good-faith effort to resolve the problem by speaking with the instructor. If this fails, students may contact the Course Coordinator. If this also fails to resolve the problem, students may contact the Director of the Lower Division, and if this too fails, the Chair of the Mathematics Department. Current contact information for these individuals is given below:

Department Chair: Alfred Noël `<Alfred.Noel@umb.edu>`

Course Structure

Textbook Reading

It is expected that you read through the relevant textbook section prior to the topic being covered in class. At the beginning of each week the expected topics to be covered should be posted on Blackboard. In addition to reading about the topic you should also utilize the textbook to practice problems in addition to those assigned.

Required Textbook

The standard textbook for Math 140 is Stewart, *Calculus: Early Transcendentals*, ninth edition. This is nearly identical to the eighth edition, so students who have already purchased the eighth edition should be able to make use of it without trouble.

Lectures

Lectures will be held in person as scheduled on Wiser. There is an expectation that you attend every class. If circumstances are such that you are not able to attend class it is your responsibility to make up any missed material, if applicable. It is strongly encouraged that you reach out to your instructor to make sure you have not missed any important announcements or assignments.

Attendance

Students are expected to regularly attend class and are responsible to complete all scheduled in-class work, such as midterms and quizzes, at the regularly scheduled times, unless an absence is authorized by the Dean of Students Office, as described in the university-wide attendance policy:

`https://www.umb.edu/registrar/policies/attendance`

Assignments

The following table is meant to be a summary. It is important that you still read the individual sections below:

Assignment	How to find assignment	due date	where grades are first posted	Late exceptions?
Quiz	Handed out	Fridays	GradeScope	1 week
Exam	Handed out	Announced in class	GradeScope	No
Final Exam	Handed out	Determined mid-semester	Blackboard	No
Written Homework	Blackboard	Wednesdays	Blackboard	No
Online homework	WebWork	Saturdays	WebWork	No

Test quizzes

There will be two in class exam and one final exam. Quizzes will occur once a week except for an exam week. Your lowest quiz grade will not be included in the final grade calculations. Quizzes and exams cannot be taken later unless there is a legitimate reason. In this case, the instructor must be notified before, the time in which the exam or quiz is scheduled, or as soon as you are able. It is the student's responsibility to arrange a time to take to an exam or quiz within one week of the original deadline. Exceptions may be made for unavoidable extended absences. Please contact the instructor as soon as possible in this situation, it is also recommended that you contact the dean of students to discuss your options. Exams and quizzes will be closed notes and closed book. Work and justification will be required for each and every problem. Missing steps or lack of details could result in a deduction of points. If the skipped step cannot be done on a basic calculator, hitting the equal sign no more than once, it will be considered insufficient work. By doing the written homework you should be able to understand what is considered "sufficient work" through the feedback provided. We may certainly discuss this further if you are not sure what is considered "sufficient work".

Travel During the Final Exam Period

This course has a final exam during the period **May 15–19, 2023.** The exact time of the final is determined by the Registrar's Office, and will be posted on WISER around the middle of the semester. Students must not make travel arrangements which might conflict with their responsibility to take the final exam at the appointed time. In particular, **a purchased airline ticket does not constitute a valid excuse to miss the final, and no makeup exam will be granted under these circumstances.**

Conflict finals

University policy specifies that any student who has two final exams scheduled at the same time, or who has three or more final exams scheduled on the same day, is eligible to reschedule one of the exams. Under these circumstances, students who wish to reschedule their final exam in this class must notify the instructor in writing **no later than Monday, May 8, 2023.** You must include the course number, the section number, your name, and your student ID number in this notification. Department staff will then verify your eligibility to reschedule, and assign you to an alternate testing time if appropriate.

Homework

There are two different types of homework assignments, online and turn in, described in this section:

Online Homework:

This course makes use of the *WeBWorK* online homework system, the link to *WeBWorK* will be provided on Blackboard.

Your instructor will provide you with additional instructions for signing into the WeBWorK server once the website is ready to use.

Written Homework:

One or two problems will be assigned and due the following week. These additional assignments will focus on writing a well justified solution. That is, the focus should be on your work and not the solution. The written assignments may be handed in during class or submitted through Blackboard. You may hand write your solution and take a picture in a well-lit room and upload to Blackboard. However, if you do upload your work to Blackboard the file type must be pdf, word document, or a fairly common image file (such as .jpg).

Tentative Schedule of Topics

Week 1: 3-dimensional coordinate systems, Vectors, Dot Product

Week 2: Cross Product,Equations of Lines and Planes

Week 3: Equations of Lines and Planes

Week 4: Vector Functions and Space Curves, Derivatives and Integrals of Vector Functions

Week 5: Motion in Space: Velocity and Acceleration, Functions on Several Variables

Week 6: Functions of Several Variables and Quadratic Surface, Level Curves, Limits and Continuity

Week 7: Directional Derivatives, Partial Derivatives

Week 8: Tangent Planes and Linear Approximation, The Multivariable Chain Rule and the Gradient Vector

Week 9: Optimization of Two-Variable Functions,Lagrange Multipliers

Week 10: Double Integrals over Rectangles, Iterated Integrals and double integrals over general regions,Double Integrals in Polar Coordinates and double integral applications

Week 11: Triple Integrals over general region, triple integrals in cylindrical coordinates, Triple Integrals in Spherical Coordinates and Change of variable in multivariable integrals

Week 12: Vector Fields, Line Integrals in Vector Fields, Fundamental Theorem of Line Integrals, Conservative Vector Fields (how to identify and how to find)

Week 13: Green's Theorem, Parametric Surfaces and Surface Integrals, Divergence Theorem

Week 14: Stoke's Theorems, Review. (For final exam and/or midterms.)