

Spring 2022
University of Rhode Island
MTH 243 Section 3: Calculus for Functions of Several Variables
Syllabus and Calendar

General Information

Instructor, Textbook, Office Hours

Class Days/Times: Our class meets TuTh, 2:00PM-3:15PM, Lippitt Hall Room 205.

Instructor: Barbara Kaskosz, bkaskosz@uri.edu.

Office Hours: Wednesdays, 12PM-1PM and Fridays 11AM-12PM via WebEx at <https://rhody.webex.com/meet/bkaskoszuri.edu>.

If you would like to meet with me at different times than listed or in person, please email me.

Text: McCallum, Hughes-Hallett, et.al., Calculus: Multivariable, 7th Edition, with **WileyPlus**.

WileyPlus Online Homework System

We will be using WileyPlus online homework system in this course. To sign up for WileyPlus, you need a WileyPlus registration code. (Make sure that you have a code for the 7th edition of our textbook and for the new WileyPlus rather than the obsolete legacy version which has been deactivated.) You can purchase a registration code at the URI Bookstore bundled with a print version of our book. Alternatively, you can buy a standalone WileyPlus registration code at the URI Bookstore or at the WileyPlus website. A registration code gives you access to the electronic version of the textbook. The flyer **WileyPlus Flyer Section 3.pdf** linked in the SYLLABUS section of our Brightspace site right under the link to this syllabus, outlines the registration steps.

During the registration process, you will be asked for the **Course Section ID** specific to our section. Our Course Section ID is:

A00648

You will find more detailed instructions in the WileyPlus flyer and on the page:

<https://www.wileyplus.com/student-register/>

SPRING 2022 MTH 243 SECTION 3 – COURSE CALENDAR

Section numbers and suggested practice problems refer to our textbook.

Week of	Sections, Events	Suggested Practice Problems from the Textbook
1/24	<i>Classes begin Monday 1/24</i> 12.1 Functions of Two Variables 12.2 Graphs of Functions of Two Variables	(12.1): #1,3,5,7,8,9,10,11,12,13,14,17,18,19,23,27,33,37,41,43; (12.2): #1,3,6,7,9,11,13,15,16,17,18,19,20,21,34,35,43,44,45,47,53;
1/31	12.3 Contour Diagrams 12.4 Linear Functions 12.5 Functions of Three Variables	(12.3): #1,2,3,4,5,7,9,10,11,16,18,30; (12.4): #1,2,3,4,5,7,10,11,12,21,22,25,35,36,46,47,50,52,57; (12.5): #1,2,3,4,6,8,9,10,16,17,19,20,30,47,49,51,53;
2/7	13.1-13.2 Introduction to Vectors 13.3 The Dot Product	(13.1): #1,2,3,4,5,7,9,11,15,17,21,25,29,31,33,34,37,38,39,41,54,55,56,59,60 (13.2): #1,2,4,6,7,8,9,10,11,15,17; (13.3): #1,3,4,5,11,15,17,19,21,23,25,28,29,30,31,32,34,35,36,40,42,44,51,52,59,63,71;
2/14	13.4 The Cross Product 14.1 The Partial Derivative 14.2 Computing Partial Derivatives Algebraically	(13.4): #1,3,5,9,11,24,29,34; (14.1): #1,4,5,6,8,11,13,15,17,19,20,29; (14.2): #3,5,7,9,11,23,24,25,31,35;
2/21	<i>No Monday classes</i> 14.3 Local Linearity and the Differential 14.4 Gradients and Directional Derivatives in the Plane Exam 1. Online. Accessible on WileyPlus: 2/24, 9AM – 2/25, 11PM.	(14.3): #1,3,5,7,9,11,13,26,29,37; (14.4): #1,7,11,15,17,19,21,23,25,27,29,31,33,45,47,49,75,97
2/28	14.5 Gradients and Directional Derivatives in the Space 14.6 The Chain Rule 14.7 Second Order Partial Derivatives	(14.5): #3,7,13,17,19,21,25,27,69; (14.6): #1,3,7,9,18,19,20,27,29,47; (14.7): #1,3,5,7,8,23,25,49;
3/7	15.1 Local Extrema 16.1 The Integral of a Function of Two Variables	(15.1): 1,2,3,4,8,14,15,19,21,25,29,41,42,53,54; (16.1): 1,3,9,11,17;
3/14	3/14-3/20 Spring Break	
3/21	16.2 Iterated Integrals 16.3 Triple Integrals	(16.2): 1,3,5,7,15,17,19,21,23,25,34,36,39,43,44,53,54,60,61,62,65; (16.3): 1,2,5,7,9,11,13,15,37,39,45,55;
3/28	16.4 Double Integrals in Polar Coordinates Exam 2. Online. Accessible on WileyPlus: 3/31, 9AM – 4/1, 11PM	(16.4): #1,3,4,5,9,11,16,17,19,20,21,31,34,36,49;
4/4	16.5 Integrals in Cylindrical and Spherical Coordinates 17.1 Parameterized Curves	(16.5): #3,4,5,8,9,11,13,15,19,21,23,24,25,29,31,51; (17.1): #1,2,3,6,7,9,11,13,15,19,20,23,27,53,61,62,65,76;
4/11	17.2 Motion, Velocity and Acceleration 17.3 Vector Fields 18.1 The Idea of a Line Integral	(17.2): #1,3,6,7,9,17,19,22,26,57; (17.3): #1,2,3,4,5,6,7,8,11,12,15,21,31; (18.1): #1,2,3,9,11,32;
4/18	18.2 Integrals over Parameterized Curves 18.3 Gradient Fields and Path-Independent Fields	(18.2): #1,3,7,9,11,12,13,14,19,35,36,41; (18.3): #1,3,5,13,17,18,19,24,35,37;
4/25	18.4 Green's Theorem Exam 3. Online. Accessible on WileyPlus: 4/28, 9AM – 4/29, 11PM	(18.4): #1,2,3,5,6,11,12,13,14,15;
5/2	Review <i>Last Day of Classes Monday, 5/2</i>	

Our Final Exam will be a two-hour, comprehensive, online exam. The Final Exam will open as a timed assignment on WileyPlus on Thursday, May 5, 8AM and will remain accessible until Tuesday, May 10, 11PM.

Grading Policy

During the semester, we will have three exams. The exams will be given online as timed assignments on WileyPlus. The times when they will be accessible are posted in the course calendar on the previous page. Those times are: Exam 1: 2/24, 9AM – 2/25, 11PM; Exam 2: 3/31, 9AM – 4/1, 11PM; Exam 3: 4/28, 9AM – 4/29, 11PM.

Please remember that you can open a timed exam on WileyPlus only once during the accessibility period and after you open it, you have a prescribed time to complete it.

Our Final Exam will be a two-hour comprehensive exam. It will be given online as a timed WileyPlus exam. The Final Exam will be accessible between, Thursday, May 5, 8AM and Tuesday, May 10, 11PM.

We will have quizzes on most weeks. These will be timed WileyPlus quizzes usually accessible all day Thursday.

Additionally, we will have weekly WileyPlus homework assignments usually due on Fridays at 11PM.

Your final grade will be based on the total of a possible 600 points distributed as follows:

- Exam 1: 100 points
- Exam 2: 100 points
- Exam 3: 100 points
- Final Exam: 150 points
- WileyPLUS Homework: 100 points
- Quizzes: 50

Total: 600 points

Your WileyPlus homework grade is the percentage of the total of possible points for all homework assignments that you receive during the semester.

Your quiz grade is the percentage of the total of possible points for quizzes that you receive during the semester scaled to 50 points. The two lowest quiz grades will be dropped.

Your final letter grade will be based on your percentage of the total of possible 600 points using approximately the usual distribution:

A (93% - 100%), A- (90% - 92%), B+ (87% - 89%), B (82% - 86%), B- (80% - 81%), C+ (77% - 79%), C (72% - 76%), C- (70% - 71%), D+ (67% - 69%), D (60% - 66%), F (0% - 59%).

More About the Course

Course Learning Outcomes

Upon successful completion of this course you will be able to:

- Draw graphs and contour diagrams of basic functions of two variables.
- Match surfaces in 3D space with their equations.
- Calculate the dot product of vectors and use the dot product to find angles between vectors, equations of planes, parallel and perpendicular components of a vector with respect to another vector.
- Calculate the cross product of two vectors and use cross product to find vectors orthogonal to two given vectors and normal vectors to planes.
- Calculate the first and the second partial derivatives of a function of two and three variables.
- Find the gradient vector and use it to calculate directional derivatives.
- Use properties of the gradient vector in the context of applied problems.
- Calculate the double integral of a function of two variables in polar and rectangular coordinates.
- Set up iterated integrals and compute triple integrals of functions of three variables over rectangular and nonrectangular solids in rectangular, cylindrical and spherical coordinates.
- Parameterize a path of integration and calculate the line integral of a vector field.
- Find a potential function of a vector field or determine that a potential function does not exist.
- Use the Fundamental Theorem for Line Integrals to calculate a line integral.
- Calculate the circulation of a vector field via Green's Theorem.

General Education Areas

MTH 243 satisfies (A1) and (B3) general education requirements:

- **A1** - Understand and apply theories and methods of the science, technology, engineering, and mathematical (STEM) disciplines; and

- **B3** - Apply the appropriate mathematical, statistical, or computational strategies to problem solving.

Available Help

When you need help in this course:

- Ask questions in class;
- Participate in your instructor's office hours;
- Email your instructor.

Visit the [Academic Enhancement Center](https://web.uri.edu/aec/tutoring/) (<https://web.uri.edu/aec/tutoring/>) website. The AEC will hold STEM tutoring sessions, drop-in tutoring, study groups and more during the semester.

Your Weekly Work

Our Brightspace site is organized into weekly modules named "Week of 9/6" and so on. Each weekly module corresponds to the textbook sections assigned in the Calendar to that week. In each weekly module, you will find supplemental learning materials: mini-video lectures, PDF notes, and worksheets. Before some classes, I will ask you to review mini-lectures and/or PDF notes **before class**. That will cut down on in-class lecturing and it will allow us to concentrate in class on solving and discussing problems. Under each weekly Brightspace module, I will specify which materials you are expected to review before class.

In each weekly Brightspace module, I will remind you about your weekly WileyPlus assignment and specify sections included in our Thursday quiz (if we have a quiz that week). WileyPlus homework will typically be due on Fridays night.

Important Policies

URI Anti-Bias Statement

We respect the rights and dignity of each individual and group. We reject prejudice and intolerance, and we work to understand differences. We believe that equity and inclusion are critical components for campus community members to thrive. If you are a target or a witness of a bias incident, you are encouraged to submit a report to the URI Bias Response Team at www.uri.edu/brt. There you will also find people and resources to help.

Disability Services for Students Statement

Please send to your instructor your Disability Services for Students (DSS) accommodation letter if you have one early in the semester to allow for adequate time to discuss and arrange your approved academic accommodations. If you have not yet established services through DSS, please contact them to engage in a confidential conversation about the process for requesting reasonable accommodations

in the classroom. DSS can be reached by calling: 401-874-2098, visiting: web.uri.edu/disability, or emailing: dss@etal.uri.edu.

COVID-19 Precautions Statement

The University is committed to delivering its educational mission while protecting the health and safety of our community. As members of the URI community, students are required to comply with standards of conduct and take precautions to keep themselves and others safe. Visit web.uri.edu/coronavirus/ for the latest information about the URI COVID-19 response.

• **Universal indoor masking is required of all community members, on all campuses and in university vehicles, regardless of vaccination status.**

- We strongly recommend surgical or higher grade masks in all indoor campus spaces. Masks should be properly worn, well-fitting, and high quality.
- Students who do not comply with the indoor masking requirement will be asked to leave class and will be reported through the Student Conduct process.
- **Students who are experiencing symptoms should NOT** go to class/work until they have received a negative test; or if they test positive, after they have completed the required isolation period. Those who test positive for COVID-19 should follow updated isolation guidelines from the Rhode Island Department of Health and CDC. Please visit the Health Services website for the most up-to-date symptomatic testing schedule.

If you are unable to attend class, please notify your instructor prior to the start of class.

Use URI Email!

According to URI policy, only your URI email account should be used for communication.