University of Rhode Island
Department of Mathematics

Course and Section number:	MTH 243 Section 04
Course Title:	Calculus of Functions of Several Variables
Semester and Year:	Spring 2018
Class Day(s)/Time:	MWF, 9:00 AM – 9:50 AM
Class Location:	Pastore Hall 122

Instructor:	Alex Kodess
Office Location:	Lippitt Hall 202H
Email:	kodess@uri.edu
Office Hours:	TTh 10:00 AM – 12:00 PM

Course Description: LEC: (3 crs.) Geometry of the three-dimensional space. The dot product and the cross product. Partial and directional derivatives, gradients. Multivariable optimization and Lagrange multipliers. Multiple integrals: integration in Cartesian, polar, spherical and cylindrical coordinates. Line integrals, path-independent integrals, and Green's Theorem.
Prerequisite(s): MTH 142
General Education Area(s) and Outcome(s): A1/B3
Credit Hours: 3
Required Textbook(s): *Multivariable Calculus* by McCallum, Hughes-Hallet, et. al., 6th edition.
Other Required Material(s): WileyPlus. No calculators! You may not use calculators on any quiz or exam, nor should you need to. (I will try to be very forgiving of any arithmetic mistakes.)

Course Goals:
This is a fairly typical Calculus III course. It lays foundations in multivariable calculus including three-dimensional coordinate system, vector geometry, partial derivatives, extrema, Lagrange multipliers, multiple and line integrals.

Learning Outcomes:
At the end of the course the student should be able to:

1. Understand multivariable functions and the basics of vectors and vector manipulation.
2. Manipulate proficiently with partial and directional derivatives of multivariable functions.
3. Understand and evaluate double and triple integrals.
4. Understand the idea of the line integral.

Grade Distribution:

20% Exam I	
20% Exam II	
15% WileyPlus HW	
15% Quizzes	
30% Final Exam	Cumulative final exam

Letter Grade Distribution:

92.00 - 100.00	A	68.00 - 70.99	C
87.00 - 91.99	A-	65.00 - 67.99	C-
82.00 - 86.99	B+	61.00 - 64.99	D+
78.00 - 81.99	B	55.00 - 60.99	D
75.00 - 77.99	B-	0.0 - 54.99	F
71.00 - 74.99	C+		

Instructor Policies for the Course:

- **Attendance**
  Attendance is a vital and necessary part of this course. While there is no formal attendance policy, we cover a lot of information at a rapid pace; missing a class will result in a large amount of material missed. Students are responsible for all missed work, regardless of the reason for absence. It is also the absentee's responsibility to get all missing notes or materials.

- **Expectations**
  - You are expected to attend every lecture and **read and work through lecture notes before they are discussed in class**.
  - The rapid pace of the class requires that you spend time every day doing homework, reviewing notes, reading the textbook, and working out extra problems, all in addition to the time spent in class. **Suggested problems will often appear on quizzes**.

- **Homework:** There will be regular homework assignments in WileyPlus. The deadlines for these assignments are fairly generous; this is to allow time to deal with any potential technical issues. Dont wait until the deadline! Its to your benefit to complete the assignments promptly. Working through the homework will reinforce your understanding of the material, which will make it easier to follow subsequent lectures. If for some reason you cannot finish the homework on time, late homework will be accepted at a 20% penalty for two days after the assignment deadline and at a 50% penalty through the end of the semester.

- **Makeup Policy**
  Makeup exams may be scheduled in the event you are unable to attend exams under the following conditions. In particular, if you must miss the exam because of a scheduling conflict, you must notify your instructor before, not after, the exam, and emergencies require you to contact your instructor within 24 hours. See University Manual sections 8.51.10 and 8.51.14 for guidelines.
  - If your reason for missing the exam as scheduled is (i) a University sanctioned event for which verifiable documentation can be provided (including another scheduled class), (ii) a responsibility to an employer that cannot be rescheduled (with documentation from your employer), or (iii) Religious holidays, then you MUST INFORM YOUR INSTRUCTOR

48 HOURS IN ADVANCE OF THE EXAM AND PROVIDE DOCUMENTATION IF REQUESTED. Makeup exams will be scheduled after the actual exam, and preferably before the class period when exams are to be handed back, but no later than one week after the original date.

- If the reason for missing the exam as scheduled is due to (i) illness (with verifiable documentation from a medical provider), or (ii) an emergency (with appropriate documentation), then you MUST INFORM YOUR INSTRUCTOR WITHIN 24 HOURS OF THE EXAM and provide documentation upon your return. Failure to notify your instructor within 24 hours will result in a 0 for the exam. No exceptions. Makeup exams may be scheduled no later than a week after the original date, unless the illness or emergency precludes this, in which case the makeup exam will be given on a common date during the last two weeks of the semester.

Students that miss course work (not exams) under the same the conditions mentioned above will be given the opportunity to make up the course work.

- **Electronic Devices**
  The classroom is a place for learning. While you are in class, I expect you to remain focused on the course material, and also to maintain an environment in which other students can do the same. In particular:
  - Laptops and tablets can be useful for taking notes or for annotating electronic copies of the provided lecture notes. However, they can also be major distractions. Avoid the temptation to screw around on the internet during class! This is distracting not only to you, but also to other students sitting nearby. Use of laptops or tablets for any purpose other than note-taking will not be permitted.
  - Cell phones should be muted and stored away at all times during class. Ringing phones are disruptive. Texting during class is flat-out disrespectful.
  - All in-class discussion must pertain to the course material. Asking your neighbor about triple integration in spherical coordinates is fine; asking them about Friday nights frat party is not. Off-topic chatter can be distracting to other students.

- **Other Policies:**
  - There is no extra credit in this course. Please don't ask.

Academic Honesty Policy:

Cheating is defined in the University Manual section 8.27.10 as the claiming of credit for work not done independently without giving credit for aid received, or any unauthorized communication during examinations. Students are expected to be honest in all academic work. The resolution of any charge of cheating or plagiarism will follow the guideline set forth in the University Manual 8.27.10-8.27.21, http://web.uri.edu/manual/chapter-8/chapter-8-2/.

Special Needs:

Any student with a documented disability should contact your instructor early in the semester so that he or she may work out reasonable accommodations with you to support your success in this course. Students should also contact Disability Services for Students: Office of Student Life, 330 Memorial Union, 874-2098. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Academic Enhancement Center (AEC):
In addition to your instructor's office hours, there is help available from the Academic Enhancement Center (AEC). The AEC offers three types of help: Weekly Tutoring Groups, Tutoring (both walk-in and appointment-based types), and Academic Coaching. For more information on AEC services, study tips, and SI session, visit the AEC website at http://web.uri.edu/aec/.

Incomplete Grade:
University of Rhode Island regulations concerning incomplete grades will be followed. See University Manual sections 8.53.20 and 8.53.21 for details.

Religious holidays:
It is the policy of the University of Rhode Island to accord students, on an individual basis, the opportunity to observe their traditional religious holidays. Students desiring to observe a holiday of special importance must provide written notification to each instructor.

Standards of behavior:
Students are responsible for being familiar with and adhering to the published "Community Standards of Behavior: University Policies and Regulations" which can be accessed in the University Student Handbook (web.uri.edu/studentconduct/university-student-handbook/). If you must come in late, please do not disrupt the class. Please turn off all cell phones or any electronic devices.

Course Calendar

Below is a tentative timetable for the course. At any point we may be a bit ahead or a bit behind, depending on the needs of the class.

Week	Sections/Events	Suggested Problems
1/22	**Classes begin – Monday 1/23** 12.1 Function of two variables 12.2 Graphs and surfaces	 1-3, 6-14,27-35, 37, 38
1/29	12.3 Contour diagrams 12.4 Linear functions 12.5 Functions of three variables	1-18, 22 1-12, 14, 23-29, 32 1-18,22,22-37
2/5	13.1 Displacement vectors 13.2 Vectors in general 13.3 The dot product	1-37, 39-43 1-28 1-65
2/12	**Drop deadline (no W on transcript) – Monday 2/12** 13.4 The cross product 14.1 The partial derivative	 1–34 1,2,17,18,24,26
2/19	**Presidents' Day, classes do not meet – Monday 2/19** 14.2 Computing partial derivatives algebraically 14.3 Local linearity, the differential	 2–40, 47, 51 1–16, 23
2/26	14.4 Gradients and directional derivatives in the plane 14.5 Gradients and directional derivatives in space 14.6 The chain rule	1–45, 48–54, 61–64, 76, 78, 84 1–12, 19–24, 25–43, 44–50 1–15, 37, 38, 45–47
3/5	**Exam I (covers Sections 12.1–14.5) – Monday 3/5** **Last day to drop courses – Monday 3/5** 14.7 Second order partial derivatives 15.1 Local extrema	 1–11, 12–19, 21–38, 41–43, 57 1–24, 28–31, 36, 37
3/12	**Spring break**	
3/19	15.3 Constrained optimization 16.1 The definite integral of functions of two variables	1–17, 19, 21 6–12
3/26	16.2 Iterated integrals 16.3 Triple Integrals	1–31, 40, 42–44, 48–53, 56, 62 1–30, 32–38, 43–48, 60–62
4/2	16.4 Double integrals in polar coordinates 16.5 Integrals in cylindrical and spherical coordinates	1–22, 24–29 1–41, 52
4/9	17.1 Parametrized curves 17.3 Vector Fields	1–49, 52, 53, 55–59, 62–65 1–19, 28–33
4/16	**Exam II (covers Sections 14.6–17.3) – Wednesday 4/18** 18.1 The idea of a line integral 18.2 Computing line integrals over parameterized curves	 1–22, 27 1–23, 33
4/23	18.3 Gradient fields and path-independent field 18.4 Path dependent vector fields and Green's Theorem	1–25, 31, 32 1–15, 18–21
4/30	Last Day of Classes	
	Final Exam – check the link for time and date `http://web.uri.edu/enrollment/final-exam-schedules/`	