

Math 18 - Intermediate Calculus

David Dumas

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1. GENERAL INFORMATION

Web Page	http://www.math.brown.edu/~ddumas/math18/
Lectures	Section 1: MWF 12:00pm - 12:50pm in BH158 Section 2: MWF 2:00pm - 2:50pm in BH158
Recitations	Section A: Tues 5:00pm - 5:50pm in BH158 Section B: Thurs 5:00pm - 5:50pm in BH158
Textbook	<i>Multivariable Calculus</i> , Fifth Edition by James Stewart, ISBN 0534393578
Instructor	David Dumas (ddumas@math.brown.edu) Office hours Mon 3-4pm, Thurs 2-3pm in Kassar 114
Teaching Assistant	Charis Tsikkou (ctsikkou@math.brown.edu) Office hours Wed 3-5pm in Kassar 013
Important Dates	Exam 1 Tues, Feb 27, 7-8pm Exam 2 Wed, Apr 11, 7-8pm Final Exam Wed, May 16, 2-5pm

2. COURSE OVERVIEW

In this course we will discuss the calculus of vector quantities and functions of several variables. We will cover approximately chapters 13–17 in the textbook (which are exactly the same as chapters 12–16 in *Multivariable Calculus—Early Transcendentals* by J. Stewart). The major topics in the course will be:

- (1) Vectors and geometry
 - Coordinates and vectors
 - Dot and cross products
 - Lines, planes, and surfaces
 - Polar, spherical and cylindrical coordinates
- (2) Vector functions
 - Definitions, vector functions and space curves
 - Derivatives, velocity and acceleration
 - Integration of vector functions
 - Arc length of space curves
- (3) Functions of several variables
 - Definitions, visualization with graphs and contours
 - Limits, continuity, and partial derivatives
 - Differentiability, linear approximation, and tangent planes
 - The chain rule
 - The gradient and directional derivatives
 - Maxima and minima, Lagrange multipliers
- (4) Multiple integrals

- Double integrals over rectangles, general regions
 - Applications to density, center of mass, probability, surface area
 - Triple integrals
 - Change of variables
- (5) Vector fields
- Definition and examples
 - Line integrals
 - Conservative vector fields and independence of path
 - Green's theorem
 - Curl and divergence of a vector field
 - Surface integrals
 - Stokes' theorem
 - The divergence theorem

3. GRADING

Your final grade for the course will be based on your homework assignments, two midterm exams, and a final exam. These components will be weighted as follows:

Homework		20%
Exam 1	Tues, Feb 27, 7-8pm	25%
Exam 2	Wed, Apr 11, 7-8pm	25%
Final Exam	Wed, May 16, 2-5pm	30%

The second midterm exam will emphasize material covered after the first exam. The final exam will cover all topics from the course.

If you have an academic obligation (such as another exam or a course meeting) that conflicts with one of the midterm exams, inform your instructor as soon as possible. If you are absent from an exam and have not made arrangements ahead of time, you will receive no credit. Exceptions can only be made in extreme cases, such as incapacitating illness.

4. HOMEWORK POLICIES

Homework will be assigned in most lectures and collected weekly in class. The homework problems will involve material from the lectures and from the assigned reading. Do not wait until the last minute to start the homework!

Your lowest homework score will be dropped before computing your final grade. Late homework will not be accepted.

5. QUIZZES

From time to time, short in-class quizzes (taking 20 minutes or less) may be given, and these will count toward your homework grade.

6. RECITATION

You should attend one of the two weekly recitation sections run by the teaching assistant (meeting times will be determined in the first week of the semester). These recitation meetings provide an opportunity to ask questions about the material from the lectures and homework assignments.

7. CALCULATORS

A calculator is not required in this course, and you will not be allowed to use a calculator for any of the exams.

Your book contains a number of exercises that are intended to be completed with the help of a graphing calculator (such as a TI-86) or a computer algebra system (like Mathematica, Maple, or Matlab). These will not be assigned as part of your regular homework, but if you are interested in using a calculator or computer, you may find them helpful.

While you are not prohibited from using a calculator or computer algebra system while working on the assigned homework, you should do so with care, and never as a substitute for understanding.

8. ATTENDANCE

Attending the lectures is mandatory; if you absolutely must miss a lecture, contact your instructor in advance, and make arrangements to get notes and any class materials from someone in your section. You are responsible for the contents of all lectures, including any that you cannot attend.

9. ACADEMIC HONESTY

All Brown University students must adhere to the standards of academic honesty set forth in the Brown Academic Code, which is available from the following URL:

http://www.brown.edu/Administration/Dean_of_the_College/academic_code/code.html

Particularly important are the following provisions:

- The homework you submit must be your own work. You may discuss the lectures, course material, and problems with other students, but the solutions you turn in must not be copied from anyone else.
- You must not receive any unauthorized assistance on the exams and quizzes.

You should refer to the academic code itself for details about these and other standards of conduct.

Suspected violations of these policies will be referred to the Standing Committee. If you are found guilty of academic dishonesty, the consequences are quite severe. Loss of credit in the course and a note on your transcript is a relatively mild but not uncommon response. Temporary or permanent separation from the university may also result.

If you have any doubt or question about any aspect of academic conduct, ask your instructor.