# MATH 2210: Calculus III

## Bronson Lim

## Fall 2017

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Office Hours: MWF 1-2pm or by appt.                        Class Hours: MWF 2:00-2:50pm
Office: JWB 101                            Class Room: Warnock Engineering Building L110

## Prerequisites and Course Information

- "C" or better in MATH 1220 (or MATH 1250 or MATH 1320) or AP Calculus BC score of at least 4.

- MATH 2210, Calculus II, is a 3 credit course.

- The textbook is **Calculus, with Differentail Equations 9e**, by *Varberg, Purcell, and Rigdon*. Any 9th edition book is fine; however, if you obtain an older edition please compare problems and sections to the 9th edition. We will cover Section 10.4 and Chapters 11-14. For information on purchasing the textbook, go to http://www.math.utah.edu/schedule/bookInfo/

## Course Description

Vectors in the plane and in 3-space, differential calculus in several variables, integration, and its applications in several variables, vector fields and line, surface, and volume integrals. Green's and Stokes' theorems.

## Expected Learning Outcomes

Upon successful completion of this course, a student should be able to:

1. Compute dot and cross products of two vectors, projection of one vector onto another vector.

2. Convert between cylindrical, rectangular and spherical coordinates. Understand when it's prudent to switch to one coordinate system over another in computing an integral.

3. Determine the equation of a plane in 3-d, including a tangent plane to a surface in 3-d.

4. Find the parametric equations of a line in 3-d.

5. Perform calculus operations on functions of several variables, including limits, partial derivatives, directional derivatives, and gradients; understand what the gradient means geometrically.

6. Find maxima and minima of a function of two variables; use Lagrange Multipliers for constrained optimization problems.

7. Understand divergence and curl of a vector field.

8. Compute double and triple integrals in rectangular, spherical and cylindrical coordinates; proper use of double or triple integrals for finding surface area or volume of a 3-d region.

9. Compute line and surface integrals.

10. Determine if a vector field is conservative and if so, find the corresponding potential function.

11. Use and understand when to apply Green's Theorem, Gauss' Divergence Theorem and Stokes Theorem.

## Additional Resources

- **Tutoring Center & Computer Lab:** There is free tutoring in the T. Benny Rushing Mathematics Student Center (room 155, the lower level between JWB and LCB), as well as a computer lab. For more information see http://www.math.utah.edu/ugrad/tutoring.html

- **Private Tutoring:** University Tutoring Services, 330 SSB. There is also a list of tutors at the math department office JWB 233.

- **Departmental Videos:** The math department has a full set of lecture videos which you are welcome to use to supplement our course material. These can be found at http://www.math.utah.edu/lectuers/

## Course Policy

I will detail the policy for this course below.

### Grading Policy

- **<u>20%</u>** of your grade will be determined by your homework scores. Roughly three textbook sections will be due most Fridays at the beginning of class (including days of exams, but not the week following). The homework will typically cover material covered up to and including the preceeding Monday. Homework assignments will be posted on the course webpage. Three of the problems will be selected for grading, each graded out of 5 points. There will also be 5 points given for completion. Variable Extra Credit will be given to those students who type their assignments in LaTeX.

- **5%** of your grade will be determined by quiz scores. In the last 15 minutes of every Wednesday class (except for Wednesdays before and after a midterm exam), a short 1-2 problem quiz testing fundamentals will be given. The quiz will cover relevant topics covered in the previous week's lectures. The lowest quiz score will be dropped.

- **45%** of your grade will be determined by three 50-minute exams (that's 15% each). You will have the whole class period to complete the exam. Practice materials will be posted a week prior to the midterm.

- **30%** of your grade will be determined by the **cumulative** final exam. Our final exam is Monday, December 11, 2017 from 1:00pm-3:00pm.

## Calculators:

Calculators will not be allowed on quizzes or exams. They may be used on homework, but you should still write out the details of your computation for credit. It is in your best interest not to become too dependent on your calculator since they will not be allowed for 80% of your grade (exams and quizzes). I would suggest only using them to check your work.

## Student Responsibilities

All students are expected to maintain professional behavior in the classroom setting, according to the Student Code (the Code), spelled out in the Student Handbook. Students have specific rights in the classroom as detailed in Article II of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, plagiarism, and/or collusion, as well as fraud, theft, etc. Students should read the Code carefully and know they are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible classroom behavious, and I will do so, begninning with verbal warnings and progressing to dismissal from class and a failing grade. Students have the right to appeal such action to the Student Behavior Committee (http://regulations.utah.edu/academics/6-400.php).

## ADA Policy

The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilites. If you will need accomodations in the class, reasonable prior notice needs to be given to the Center for Disability and Access (CDA), 162 Olpin Union Building, 801-581-5020. CDA will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in alternative format with prior notification to the CDA.

## Adressing Sexual Misconduct

Title IX makes it clear that violence and harassment based on sex and gender (which Includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with disability, vterans status, or genetic information. If you or someone you know has been harassed or assaulted,

you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of the Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677 (COPS).

## Student Names and Personal Pronouns

Class rosters are provided to the instructor with the students legal name as well as Preferred first name (if previously entered by you in the Student Profile section of your CIS account). While CIS refers to this as merely a preference, I will honor you by referring to you with the name and pronoun that feels best for you in class, on papers, exams, group projects, etc. Please advise me of any name or pronoun changes (and update CIS) so I can help create a learning environment in which you, your name, and your pronoun will be respected. If you need assistance getting your preferred name on your UIDcard, please visit the LGBT Resource Center Room 409 in the Olpin Union Building, or email bpeacock@sa.utah.edu to schedule a time to drop by. The LGBT Resource Center hours are M-F 8am-5pm, and 8am-6pm on Tuesdays.

## Wellness Statement

Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a students ability to succeed and thrive at the University of Utah. For helpful resources contact the Center for Student Wellness at www.wellness.utah.edu or 801-581-7776.

## Course Roadmap Week-by-Week

Below is an outline and rough schedule of the sections and topics covered in this course. We are more likely to fall behind than get ahead. If we are behind, exam reviews may be scheduled outside class time.

**Week 1, 08/21 - 08/25:**   Introduction, Sections 10.4, 11.1

**Week 2, 08/28 - 09/01:**   Sections 11.2, 11.3, 11.4 **Note, Friday Sep. 1 is the last day to drop.**

**Week 3, 09/04 - 09/08:**   Sections 11.5, 11.6, 11.7

**Week 4, 09/11 - 09/15:**   Sections 11.8, 11.9, 12.1

**Week 5, 09/18 - 09/22:**   Section 12.2, review, Exam 1 (Sep. 22)

**Week 6, 09/25 - 09/29:**   Sections 12.3, 12.4, 12.5

**Week 7, 10/02 - 10/06:**   Sections 12.6, 12.7, 12.8

**Week 8, 10/09 - 10/13:**   Fall Break

**Week 9, 10/16 - 10/20:**   Sections 12.9, 13.1, review, Exam 2 (Oct. 20)

**Week 10, 10/23 - 10/27:**   Sections 13.2, 13.3, 13.4, 13.5

**Week 11, 10/30 - 11/03:**   Sections 13.6, 13.7, 13.8

**Week 12, 11/06 - 11/10:**   Sections 13.9, 14.1, 14.2, review

**Week 13, 11/13 - 11/17:**   Exam 3 (Nov. 20) **Thanksgiving Holiday Nov. 23-26**

**Week 14, 11/20 - 11/24:**   Sections 14.3, 14.4,

**Week 15, 11/27 - 12/01:**   Sections 14.5, 15.6,

**Week 16, 12/04 - 12/08:**   Section 14.7, review

**Week 17, 12/11 - 12/15:**   Final Exam Monday Dec. 11th from 1:00-3:00pm.