

# Math 1320-001: Engineering Calculus 2

## Spring 2014

**Instructor:** Patrick Bardsley  
**Lectures:** M,T,W,F 7:30-8:20AM LCB 225  
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**Lab instructor:** Qing Xia  
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**Lab instructor office hours:** TBA (located in WEB 1622)  
**Lab:** Thursday- Section 002 - 7:30-8:20AM LCB 323  
Section 003 - 8:35-9:25AM LCB 225

**\*\*\*Announcements, assignments, files, and grades will be updated on Canvas (access through CIS)\*\*\***

**Textbook:** *Calculus: Concepts and Contexts* by James Stewart (ISBN-13: 978-0-495-56053-1)  
(ISBN-10: 0-495-56053-7)

	Quiz 1	January 31, 2014
	Midterm Exam 1	February 14, 2014
<b>Important Dates:</b>	Quiz 2	March 7, 2014
	Midterm Exam 2	March 28, 2014
	Quiz 3	April 18, 2014
	Final Exam	April 29, 2014 (8AM-10AM LCB 225)

**Course description:** This course is the second part of the Engineering Calculus series and will cover intermediate knowledge of Calculus used for engineering applications. The course is structured into four lecture hours per week, and one lab hour per week.

Calculus is a set of tools to analyze the behavior of functions, useful in modeling physical processes important in engineering applications. At the end of the course, students will understand the following: how to compute areas and volumes using integrals, arc length, curvature, average values of functions, basic differential equation models and methods, direction fields, Euler's Method, separable differential equations, sequences, series, power series, Taylor and Maclaurin series, convergence tests, three dimensional coordinates and functions, vector functions, space curves, derivatives and integrals of vector functions, multivariable functions, limits and continuity in higher dimensions, partial derivatives, tangent planes, Lagrange Multipliers, and applications. More information on specific learning outcomes of the course is found below.

The work you will complete in Math 1320 comprises weekly homework, three quizzes, two midterm exams, a comprehensive final exam, and lab participation. Homework will be turned in every Friday except on holidays, and the three lowest homework scores will be dropped. Midterm exams will be given the dates listed above and a review will take place during lab sections the Thursday of that week. Exam and quiz scores will not be dropped under any circumstance, however the comprehensive final exam score can replace one midterm score provided it is lower than the final exam. Finally, earning credit in the lab sections entails attendance points and participation points.

- **Homework:** (15%) Roughly three textbook sections are due every Friday at the end of class, based on lecture sections covering through the preceding Wednesday. In Canvas you will see listings of assigned problems. The assignments will be updated dynamically through the course, so be sure to check Canvas often to see the specific problems due each week. About two problems per section will be randomly selected for grading. Three of a student's lowest homework scores will be dropped. *Only hardcopy assignments will be accepted in person - no digital copies - no late homework will be accepted.*
- **Quizzes:** (5%) Two weeks prior to each exam, a quiz will be given on select Fridays, consisting of 3-5 problems and taking roughly 30 minutes to complete. The quiz will cover material from the preceding weeks and is designed to give students practice solving calculus problems in an exam setting.
- **Midterm exams:** (2×20%) Two 50-minute midterm exams will be given on select Fridays (listed above). Review will take place the Thursday before the exam during lab sections. A practice exam will be posted a week prior to the midterm that will cover the same material.
- **Final exam:** (25%) *Tuesday 4/29/2014, 8-10AM* A two-hour comprehensive exam will be given at the end of the semester. As with the midterms, a practice final will be posted a week prior.
- **Lab:** (15%) Every Thursday a TA-directed lab section will be held. Worksheets are given during these lab sections, designed to reinforce and extend material covered in lectures to help develop problem solving skills. Students will work in groups with guidance from the TA to solve “real world” application problems. Credit will be given for lab attendance (5%) and worksheet grades (10%).

**Grading Policies:** Grades are computed as a weighted average comprising 15% homework scores, 5% quiz scores, 15% for lab attendance and participation, 40% midterm exam scores, and 25% for the final exam score. All students are required to take the final exam.

The grading scale will be as follows:

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

**Engineering Tutoring Center:** There will be tutoring available in the Warnock Engineering Building (WEB). Lab instructors from the various 1320 courses will be available to help with homework and lab worksheets. The lab instructor for this section will be holding office hours here and students are encouraged to use this valuable resource. Additional details for the Engineering Tutoring Center (including available hours) will be made available on Canvas.

**Additional Tutoring:** The Benny T. Rushing Math Center (located in the basement of LCB) offers free drop-in tutoring for students at the U. This is another great resource! The hours of operation are Monday-Thursday 8-8 and Friday 8-6. They can also give you information about private tutors.

**ADA Statement:** The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations.

## Week-by-week guide

**Week 1 (1/6/14 - 1/10/14):** 6.1, 6.2, 6.3, 6.4 – Areas, Volumes, Cylindrical Shells, Arc Length

**Week 2 (1/13/14 - 1/17/14):** 6.5, 6.6, 7.1 – Average Values, Applications to Engineering, Intro to DE's

**Week 3 (1/20/14 - 1/24/14):** 7.2, 7.3, 7.4 – Direction Fields, Separable Equations, Exponential Growth/Decay

**Week 4 (1/27/14 - 1/31/14):** 8.1, 8.2, 8.3 – Sequences, Series, Integral and Comparison Tests, *QUIZ 1*

**Week 5 (2/3/14 - 2/7/14):** 8.4, 8.5, 8.6 – Power Series, Functions as Power Series, Functions as Power Series

**Week 6 (2/10/14 - 2/14/14):** 8.7, 8.8, Review – Taylor and Maclaurin Series, Applications, **MIDTERM 1**

**Week 7 (2/17/14 - 2/21/14):** 9.1, 9.2, 9.3 – Three-Dimensional Coordinates, Vectors, The Dot Product

**Week 8 (2/24/14 - 2/28/14):** 9.4, 9.5 – The Cross Product, Lines and Planes

**Week 9 (3/3/14 - 3/7/14):** 9.6, 9.7, 10.1 – Functions and Surfaces, Cylindrical and Spherical Coordinates, Vector Functions, *QUIZ 2*

### *SPRING BREAK!*

**Week 10 (3/17/14 - 3/21/14):** 10.2, 10.3, 10.4 – Derivatives and Integrals of Vector Functions, Arc Length and Curvature, Motion in Space

**Week 11 (3/24/14 - 3/28/14):** 10.5, Review – Parametric Surfaces, **MIDTERM 2**

**Week 12 (3/31/14 - 4/4/14):** 11.1, 11.2, 11.3 – Multivariable Functions, Limits and Continuity, Partial Derivatives

**Week 13 (4/7/14 - 4/11/14):** 11.4, 11.5 – Tangent Planes and Linear Approximations, The Chain Rule Revisited

**Week 14 (4/14/14 - 4/18/14):** 11.6, 11.7 – Directional Derivatives and The Gradient, Maximum and Minimum Values, *QUIZ 3*

**Week 15 (4/21/14 - 4/25/14):** 11.8, Review – Lagrange Multipliers, Review for Final

**Final: (April 29, 2014) Comprehensive Final Exam (8AM-10AM)**