

CALCULUS III  
MATH 250A, Section 8  
Course ID: 17882  
Fall 2019

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**Instructor:** Roberto Soto, Ph.D.  
**Office:** MH 380A  
**Office hours:** Mondays and Wednesdays, 4:30 - 5:20 pm  
  
**Email:** rcsoto@fullerton.edu (This is the best way to reach me)  
**Phone:** (657) 278-2743

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**Classroom:** MH 655  
**Class Time:** Mondays and Wednesdays, 2:30 pm - 4:20 pm  
**Credit hours:** 3 units

**Text:** *Essential Calculus : Early Transcendentals, CSUF Custom Edition, 2E*, by Stewart, Cengage Learning, 2013.

**Calculator:** You are allowed to use a scientific calculator on your exams. We will use GeoGebra's 3D graphing calculator in class. See <https://www.geogebra.org/3d?lang=en>.

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**Course Description:**

Thus far you should feel comfortable with understanding calculus dealing with functions that take one input and produce one output. But in this course we focus on extending our understanding of calculus to functions that can model phenomena that is closer to the real world, with multiple inputs giving one output. Of course this means that we might have to modify our understanding of what derivatives and integrals mean when we have more than one output.

The topics covered in this course include vector-valued functions, partial derivatives and multiple integrals with applications, vector fields, line integrals, Green's Theorem, Stokes' Theorem, and the Divergence Theorem.

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**Course Structure:**

This class will be structured differently than traditional lecture courses. By now most of us have realized that we learn mathematics by actually doing mathematics and by working with others. Thus it is imperative that we are well prepared for each class so we can learn from each other which means that class is structured in such a way so as to maximize the amount of discussion. Here's the plan for most weeks:

- I will post reading assignments and “basic” computational exercises each Saturday. You are expected to use Saturday and Sunday to read your book, work on the computational exercises, and start thinking about the questions that you still have unanswered. We will also use a dynamic discussion tool, VoiceThread, to discuss your solutions to the exercises before class on Monday. All work on VoiceThread (Entrance Tickets) will be due on Sundays by 11:59 pm. Late Entrance Tickets will not be accepted nor can they be made up.
- We will begin each Monday by answering the questions that you pondered over the weekend. Afterwards we will work on 10-20 problems that are extensions of what you did over the weekend. We will split into groups of four and work together on solving these problems. We will then use approximately 30-45 minutes to work together on these problems. We will use the rest of the class period to discuss the ideas that came from our group work. A pair from each group will be asked to summarize their group's work and post it on a dynamic discussion forum called VoiceThread. Wednesdays will run in a similar manner.
- Your individual homework is to write up clear solutions to 5 of the problems during the week that were the toughest for you. This will be due each Friday, through Titanium, by 11:59 pm.
- **Note:** VoiceThread links will be found on Titanium.

**Student Evaluation:**

**So how will you be graded for a course designed in this way?** This course uses standards based grading, which differs in some significant ways from traditional points-based grading. With a few exceptions, all assignments and assessments are graded either "proficient" or "revise." Your grade in the course is determined by the number of standards that you score proficient on by the end of the semester, according to the chart below.

	To earn an A	To earn a B	To earn a C	To earn a D
Entrance Tickets	Earn 90% of points	Earn 80% of points	Earn 70% of points	Earn 60% of points
Monday Presentations	2 required	1 required	Not required	Not required
Monday VoiceThread	Earn 90% of points	Earn 80% of points	Earn 70% of points	Earn 60% of points
Wednesday Presentations	2 required	1 required	Not required	Not required
Wednesday VoiceThread	Earn 90% of points	Earn 80% of points	Earn 70% of points	Earn 60% of points
Graded Homework Problems	Earn 85% of points	Earn 70% of points	Earn 55% of points	Earn 40% of points
Skill Checks (Exams)	Certify all skill checks twice	Certify all but 2 skill checks twice	Certify all but 3 skill checks twice	Certify at least 10 skill checks

**Note:** In order to earn the grade in the top row you have to meet all of the requirements below that grade. If you miss one requirement then you will earn the grade in which all requirements are met.

**Exams - Skill Checks**

Each exam will contain skill checks outlined in the document **Learning Objectives**. To demonstrate mastery of these skills you will have to **certify** each skill **twice** during the semester. Opportunities to certify these skills will be given on the exam dates below. Note that this means that I do not curve grades - I expect you to learn the material.

**Exam Dates:**

All exams will be held in MH 655.

**Exam 1** Wednesday, September 18, 2019 during class

**Exam 2** Wednesday, October 23, 2019 during class

**Exam 3** Monday, December 2, 2019 during class

**Final Exam** Wednesday, December 18, 2019 from 3 pm - 4:50 pm

**Make-up Exam Policy:**

No make-up exams will be given since this is a standards based course. You will have ample opportunities to demonstrate that you have met or exceeded our standards. The only exam that may require a make-up is the final and only in case of a medical emergency or death in the family. These emergencies require valid documentation, and the instructor must be notified within 24 hours of the exam.

**Class Expectations:**

We are all expected to come to class well prepared so that we can all benefit from our time together. In particular, you should come to class having studied the assigned readings and problems, be ready to present your problem or theorem if it is your turn to present, and be ready to ask questions and participate in all class discussions. Moreover, you will also have the opportunity in class to interact with each other in small groups. Your success in maximizing your learning will depend largely on the interactivity of the group and on the group's willingness and effectiveness in help each other.

Finally, please check TITANium often since all assignments and class handouts will be posted there.

**Attendance:**

You are expected to actively participate in your learning, thus it is of the utmost importance that you attend each class session. Note that being absent from class can negatively affect your grade in the course, thus if need to miss a class please inform me as soon as possible. It is your responsibility to obtain from your classmates any missed lecture notes and assignments. Any handouts given in class will be available through TITANium.

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**Learning  
Environment  
Expectations:**

Please respect your classmates and remember that everyone is entitled to the opportunity to learn. In view of this:

- Leave all non-calculator electronic devices in your backpack and turn off ringers and other noises. (If you have a writing difficulty that makes it necessary for you to use a laptop to take notes, please provide an accommodations form from DSS).
- Avoid disruptive behavior (such as isolated conversations) while one of your fellow classmates or I am presenting material.
- Leave class during the class period only if necessary.
- Derogatory or dismissive language directed at other students in the class will not be tolerated.
- Violations of this policy will result in a warning. Repeated warnings may result in temporary or permanent dismissal from the class.

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**Withdrawal  
Deadlines:**

Please make sure to keep the following dates in mind.

- **Tuesday, September 10, 2019**

Last day to withdraw from course without a “W”. Students can drop via Titan Online.

- **Friday, October 4, 2019**

Math Department’s deadline to withdraw without a serious and compelling reason

- **Thursday, November 14, 2019**

University’s deadline to withdraw with a truly serious and compelling reason that is beyond the student’s control. Students must document their reason. See Math Department for more information

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**CSUF Policy on Academic Dishonesty:**

Academic dishonesty will not be tolerated. The University *Catalog* and the *Class Schedule* provide a detailed description of Academic Dishonesty under ‘University Regulations.’ (Or read this link on CSUF’s policy on [Academic Dishonesty](#).)

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**CSUF Policy on Disabled Students:**

The University requires students with disabilities to register within the first week of classes with the Office of Disability Support Services (DSS), located in UH-101 and at (657) 278-3112 in order to receive prescribed accommodations and support services appropriate to their disability. Students requesting accommodations should inform their instructors during the first week of classes about any disability or special needs that may require specific arrangements/accommodations related to attending class sessions, completing course assignments, writing papers or quizzes, tests or examinations.

Click on the links for further information about the services provided by DSS to [students](#) and the obligations of [faculty](#) in making accommodations for students registered with the office of DSS.

**Emergency Procedures:**

All students should be aware of what needs to be done in the case of an emergency, such as an earthquake, a fire, or other disasters, natural or otherwise. Be sure to look at the [CSUF Emergency Preparedness](#) website for critical information about your safety.

**Learning Objectives:**

To complete this course students will be able to:

- Understand the meaning of a multi-variable function and generalize the concepts of single-variable calculus to this setting.
- Understand some of the applications of the tools we learn in multivariable calculus.
- Understand how Green's, Stokes', and the Divergence Theorem generalize the Fundamental Theorem of Calculus in different ways.
- Demonstrate mastery of the following skills associated with the study of multivariable calculus (these will be tested on Exams - see Standards List)
  1. Functions and basics
  2. Vectors
  3. Differentiation
  4. Integration
  5. Parametrizations
  6. Vector fields
- Clearly communicate ideas and thoughts in writing and verbally.
- Analyze and critique solutions written by others.

**Tentative Course Schedule**

Week of	Monday	Wednesday
8/25	Syllabus Sec. 10.1 Three Dimensional Coordinate Systems Sec. 10.2 Vectors	Sec. 10.2 Vectors Sec. 10.3 The Dot Product
9/1	<b>Holiday</b>	Sec. 10.3 The Dot Product Sec. 10.4 The Cross Product
9/8	Sec. 10.4 The Cross Product Sec. 10.5 Equations of Lines and Planes	Sec. 10.5 Equations of Lines and Planes Sec. 10.7 Vector Functions and Space Curves
9/15	Sec. 10.7 Vector Functions and Space Curves Sec. 10.8 Arc Length and Curvature	<b>Exam 1</b> Sec. 10.9 Motion in Space: Velocity and Acceleration
9/22	Sec. 11.1 Functions of Several Variables	Sec. 11.2 Limits and Continuity Sec. 11.3 Partial Derivatives
9/29	Sec. 11.3 Partial Derivatives Sec. 11.4 Tangent Planes and Linear Approximations	Sec. 11.4 Tangent Planes and Linear Approximations Sec. 11.5 The Chain Rule Sec. 11.6 Directional Derivatives and the Gradient Vector
10/6	Sec. 11.6 Directional Derivatives and the Gradient Vector Sec. 11.7 Max and Min Values	Sec. 11.7 Max and Min Values Sec. 11.8 Lagrange Multipliers
10/13	Sec. 12.1 Double Integrals over Rectangles	Sec. 12.2 Double Integrals over General Regions
10/20	Sec. 12.3 Double Integrals in Polar Rectangles	<b>Exam 2</b> Sec. 12.5 Triple Integrals
10/27	Sec. 12.5 Triple Integrals Sec. 12.6 Triple Integrals in Cylindrical Coordinates	Sec. 12.7 Triple Integrals in Spherical Coordinates
11/3	Sec. 13.1 Vector Fields Sec. 13.2 Line Integrals	Sec. 13.2 Line Integrals
11/10	<b>Holiday</b>	Sec. 13.3 The Fundamental Theorem for Line Integrals Sec. 13.4 Green's Theorem
11/17	Sec. 13.4 Green's Theorem Sec. 13.5 Curl and Divergence	Sec. 13.6 Parametric Surfaces and Their Areas
11/24	<b>Thanksgiving Break</b>	
12/1	<b>Exam 3</b> Sec. 13.7 Surface Integrals	Sec. 13.7 Surface Integrals
12/8	Sec. 13.8 Stokes' Theorem	Sec. 13.9 The Divergence Theorem
12/15		Final Exam, MH 655, 3-4:50 pm