Calculus III: Math 252, Fall 2017

Schedule Number: 22253, 22354, 22255, and 22256

Instructor: Dr. Bo-Wen Shen*

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(Last Updated: 2017/08/28)

COURSE INFORMATION

Class Days: TTH (Tuesday and Thursday)
Class Times: 9:30-10:45 am
Class Location: HH-130

Dr. Bo-Wen Shen:
Office Hours Times (and by appointment): 10:55-11:55am TTH
Office Hours Location: GMCS 569

Breakout sections: Wednesday
Mr. Nicholas Ferrante & Mr. William Byrd

Sec 08, 10:00-10:50 P-146	10:00-12:00 (M); 14:00-16:00 (Th); **MLC**
Sec 09, 11:00-11:50 P-146	10:00-12:00 (M); 14:00-16:00 (Th); **MLC**
Sec 10, 14:00-14:50 P-149	12:30-14:30 (TTH); **MLC**
Sec 11, 13:00-13:50 E-427	12:30-14:30 (TTH); **MLC**

Office Hours: Time and Location

Course Overview

Course Content: (1) vector vs. scalar; dot products and cross products; (2) vector function; space curve; (3) functions of two or three variables; partial derivatives; tangent planes and linearization; directional derivatives and gradient vector; differentiable functions; (4) multiple integrals (e.g., double or triple integrals); (5) vector fields and line integrals; the fundamental theorem of line integrals; curl and divergence; Green's Theorem; Stokes' Theorem; Divergence Theorem

Student Learning Outcomes: Students will learn the above topics and their applications to engineering or science fields. Examples include visualizations of flows in 2D or 3D flows, wind-chill index as a function of two variables with air temperature and wind speed.

Relation to Other Courses: Math 252 is the third semester of the series, Calculus I-II-III (Math 150 151-252). A majority of the students who major in a branch of engineering or science take Math 252. Students may further take advanced courses such as numerical analysis (math541), ordinary differential equations (math337 and math537), computational ordinary differential equations (math542), partial differential equations (math531), advanced calculus (math 534), etc.

Enrollment Information

- Prerequisites: Mathematics 151 with minimum grade of C

Course Materials

- Text: Multivariable Calculus, 8th Edition by James Stewart, 2014. Brooks/Cole Cengage Learning,

  ISBN: 978-1-285-74155-0

Online homework: www.webassign.net (class code: **sdsu 9745 4794**)

Course Structure and Conduct

Style of the Course: Lecture with derivations (on the whiteboard) and outlines and notes (through the projector)

Course Assessment and Grading

- Weekly homework: 20% (Due at 5:00 pm on Friday*)
- (Pop) Quizzes (2.5%, 2.5%, 5%) 10% (one of them will be posted on webassign.net)
- Mid Term 1 (Sep. 21, Th): 20%
- Mid Term 2 (Oct. 26, Th): 20%
- (an on-line quiz, by or on Nov. 21, Tu) 5%
- Final Exam (Dec 16, Sat): 30%

- Class Attendance: Students are required to attend all class meetings including discussion sections. The class attendance will be taken randomly.
- Make-up exams: NO
- * Weekly homework will be posted by 5:00 pm every Wednesday, and will be due at 5:00 pm next Friday. The worst homework grade will be dropped.

Course Grade

You will be guaranteed the following grades as given by your percentage score on the homework, pop quizzes, midterms, and final exam.

A 90%	B 80%	C 70%	D 60%
A- [89%, 90%)	B+ [85%, 89%)	C+ [75%, 79%)	D+ [65%, 69%)
	B [80%, 85%)	C [70%, 75%)	D [60%, 65%)
	B- [79%, 80%)	C- [69%, 70%)	D- [59%, 60%)

Important Dates

- August 28 (M), First day of Classes
- August 29 (T): First day of Class Math 252
- September 4 (M): Labor Day
- September 7 (Th): Last day for faculty to drop students from classes.
- September 11 (M): Last day to officially withdraw from the university without penalty fee for Fall semester 2016.
- Mid Term 1 (Sep. 21, Th):
- Mid Term 2 (Oct. 26, Th):
- November 4 (S): Last day to officially withdraw from all classes for fall 2017 and receive a prorated refund (withdrawal after November 11 requires special approval and a penalty fee is assessed).
- November 10 (F): Veteran Day
- On-line Quiz (by or on Nov. 21, Tu)
- November 23-24: Holiday—Thanksgiving recess
- Dec 14 (Th): Last day of classes before final examinations
- Dec 16 (Sat): Final Exam (09:30-11:30)
- Dec 29: Grades due from instructors. (11 p.m. deadline.)

Students with Disabilities

If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473. To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Please note that accommodations are not retroactive, and that accommodations based upon disability cannot be provided until you have presented your instructor with an accommodation letter from Student Disability Services. Your cooperation is appreciated.

Academic Honesty

The University adheres to a strict policy regarding cheating and plagiarism. These activities will not be tolerated in this class. Become familiar with the policy (http://www.sa.sdsu.edu/srr/conduct1.html). Any cheating or plagiarism will result in failing this class and a disciplinary review by Student Affairs.

Examples of Plagiarism include but are not limited to:

- Using sources verbatim or paraphrasing without giving proper attribution (this can include phrases, sentences, paragraphs and/or pages of work)
- Copying and pasting work from an online or offline source directly and calling it your own
- Using information you find from an online or offline source without giving the author credit
- Replacing words or phrases from another source and inserting your own words or phrases
- Submitting a piece of work you did for one class to another class

If you have questions on what is plagiarism, please consult the policy (http://www.sa.sdsu.edu/srr/conduct1.html) and this helpful guide from the Library:(http://infodome.sdsu.edu/infolit/exploratorium/Standard_5/plagiarism.pdf)

At the end of the course, students will be ranked from first to last for each category (i.e. worst to be.st). The number of participation points allocated will then be based on each student's overall relative ranking score.

Interacting with me

I'll try to respond within 24-48 hours to emails sent me (sdsu.math252.shen@gmail.com) from within Blackboard. For quick questions, the turnaround time may be much shorter. (If Blackboard is not working or for non-course-related communications, write to me using my work email address: bshen@mail.sdsu.edu.)

Please feel free to call me in my office at (619) 594-5962. My message phone works most of the time, but email is to be preferred. My regular office hours are WF 10-11:30am Pacific Time.

Course Outline

Chapter	Sections	Remarks
12: Vectors and The Geometry of Space		~ 2 weeks
	12.1 3D Coordinate Systems	
	12.2 Vectors	
	12.3 The Dot Product	
	12.4 The Cross Product	
	12.5 Equations of Lines and Planes	
	12.6 Cylinders and Quadric Surfaces	
13: Vector Functions		~ 2 weeks
	13.1 Vector Functions and Space Curves	
	13.2 Derivations and Integrals of Vector functions	
	13.3 Arc Length and Curvature	
	13.4 Motion in Space: Velocity and Acceleration	
14: Partial Derivatives		~ 3 weeks
	14.1 Functions of Several Variables	
	14.2 Limits and Continuity	
	14.3 Partial Derivatives	
	14.4 Tangent Planes and Linear Approximations	

Chapter	Sections	Remarks
	14.5 The Chain Rule	
	14.6 Directional Derivatives and the Gradient Vector	
	14.7 Maximum and Minimum Values	
	14.8 Lagrange Multipliers	
15: Multiple Integrals		~ 3 weeks
	15.1 Double Integrals over Rectangles	
	15.2 Iterated Integrals	
	15.3 Double Integrals over General Regions	
	15.4 Double Integrals in Polar Coordinates	
	15.5 Applications of Double Integrals	
	15.6 Surface Area	
	15.7 Triple Integrals	
	15.8 Triple Integrals in Cylindrical Coordinates	
	15.9 Triple Integrals in Spherical Coordinates	
	15.10 Change of Variables in Multiple Integrals	
16: Vector Calculus		~ 3.5 weeks
	16.1 Vector Fields	
	16.2 Line Integrals	
	16.3 The Fundamental Theorem for Line Integrals	
	16.4 Green's Theorem	
	16.5 Curl and Divergence	
	16.6 Parametric Surface and Their Areas	
	16.7 Surface Integrals	
	16.8 Stokes' Theorem	
	16.9 The Divergence Theorem	
	16.10 Summary	