



Math 23B

Vector Calculus

Tu-Th, 9:00am - 12:30pm, Engineering 2 192

Gabriel Martins

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Office: McHenry 4112

Office Hours: Tu-Th 1:30pm to 3:00pm

I might make slight updates to the syllabus during the course.  
You can always find an updated version on the class website.

**Course Description:** Double integral, changing the order of integration. Triple integrals, maps of the plane, change of variables theorem, improper double integrals. Path integrals, line integrals, parametrized surfaces, area of a surface, surface integrals. Green's theorem, Stokes' theorem, conservative fields, Gauss' theorem. Applications to physics and differential equations, differential forms. (Formerly Multivariable Calculus.)

**Prerequisite(s):** Math 23A

**Credits:** 5 units

**Text:** *Vector Calculus*, 6th Edition

**Authors:** J. Marsden; A. Tromba; **ISBN-13:** 978-1429215084

### Course Objectives:

At the completion of this course, students will be able to:

1. Compute 2 and 3 dimensional integrals
2. Compute path and line integrals
3. Compute surface integrals
4. Make use of Green's, Stokes' and Gauss' theorems

### Grade Distribution:

Assignments	25%
Quizzes	5%
Midterm Exam	30%
Final Exam	40%

**Quizzes:** There will be a quiz at the beginning of every lecture. A quiz score will be determined from the five best quizzes for each student.

There will be **no quiz** on our first lecture or on exam days.

**Homework:** Every week a problem set will be assigned and collected at the beginning of lecture on Tuesdays. The homework score will be taken from the best three scores out of four.

There will be **no homework** assigned on the last week of classes.

**Midterm Exam:** There will be a single midterm exam on Tuesday August 11.

**Final:** A cumulative final exam will be held on the last day of class, Thursday August 27.

**Section:** Mo/We 1:00pm-2:45pm - Jack Baskin Engineering 165

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**Important Summer Session 2 Dates:**

Thursday July 30: Enrollment period ends.

Monday August 3: Drop period ends.

Friday August 7: Deadline to change grade option.

Friday August 14: Withdrawal period ends.

Saturday September 5: Grades posted.

**Students with Disabilities:** If you qualify for classroom accommodations because of a disability, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me as soon as possible, preferably within the first week of the Summer Session. Contact DRC by phone at 831-459-2089 or by email at drc[at]ucsc[dot]edu for more information.

**Tutoring:** If you would like to hire a tutor for this class, just let me know, and I will put you in contact with possible tutors. Additionally, a list of tutors is supplied by the Math Department at <http://www.math.ucsc.edu/undergraduate/tutor-list.html>.

**Late Policy:** I do not accept late homework or give makeup quizzes.

**Local Discounts:** Check this site for a list of discounts available to summer session students in the Santa Cruz area: <http://summer.ucsc.edu/resources/local-discounts.html>

### Tentative Course Outline:

The topic coverage might change as it depends on the progress of the class.

Date	Topics covered
Tue 07/28	<ul style="list-style-type: none"><li>• Double integrals, changing the order of integration.</li><li>• Sections: 5.2, 5.3, 5.4</li></ul>
Thu 07/30	<ul style="list-style-type: none"><li>• Triple integrals, examples, review on derivatives.</li><li>• Section: 5.5</li></ul>
Tue 08/04	<ul style="list-style-type: none"><li>• Change of variables, polar, cylindrical and spherical coordinates.</li><li>• Section: 6.2</li></ul>
Thu 08/06	<ul style="list-style-type: none"><li>• Integrals over curves: path and line integrals</li><li>• Sections: 7.1, 7.2</li></ul>
Tue 08/11	<ul style="list-style-type: none"><li>• Review of previous material</li><li>• Midterm exam</li></ul>
Thu 08/13	<ul style="list-style-type: none"><li>• Parametrized surfaces, integrals over surfaces</li><li>• Sections: 7.3, 7.5, 7.6</li></ul>
Tue 08/18	<ul style="list-style-type: none"><li>• Stokes' and Green's theorems</li><li>• Sections: 8.1, 8.2</li></ul>
Thu 08/20	<ul style="list-style-type: none"><li>• Gauss' theorem, applications</li><li>• Section: 8.3</li></ul>
Tue 08/25	<ul style="list-style-type: none"><li>• More applications, review.</li></ul>
Thu 08/27	<ul style="list-style-type: none"><li>• Final Exam</li></ul>