Math 23b Syllabus Summer 1 2021

Course Learning Objectives

- Master The integral Calculus of Several Variables at a High Level
- Topics to be mastered are
  - The Double and Triple Integrals
  - Line, Path and Surface Integrals
  - Fundamental Theorems of Calculus in Several Variables and their Applications to Physics

General Information

<table>
<thead>
<tr>
<th>Time:</th>
<th>That's up to YOU</th>
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</thead>
<tbody>
<tr>
<td>Location:</td>
<td>Wherever you have Internet!</td>
</tr>
<tr>
<td>Course Authors:</td>
<td>Tony Tromba, Frank Bäuerle</td>
</tr>
<tr>
<td>Course Hosts:</td>
<td>UCSC, UC Online</td>
</tr>
<tr>
<td>Course Designer:</td>
<td>Alan Roper</td>
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<tr>
<td>Instructors:</td>
<td>Frank Bäuerle, Longzhi Lin, Tony Tromba</td>
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</table>
Teaching Assistants (TAs): See the complete list at the bottom of the home page.

Office Hours (OH)

The instructors and TAs hold office hours online via ZOOM, our webinar software. A range of times are available. Check the Office Hours page in the Support Options module for details.

Discussion Sections/T.A.'s

Your TA's (teaching assistants) will help facilitate the on-line discussion groups and also hold on-line office hours. There are discussion sections at various times on-line. Check the Support Options module for details.

Study Groups

We are encouraging students from to volunteer to organize and form study groups (https://cole2.uconline.edu/courses/1699142/pages/college-based-study-groups).

E-Textbook (LaunchPad)

The textbook (a customized version of Calculus, Early Transcendentals, 2nd ed, by Jon Rogawski) and Vector Calculus, 6th ed, by Marsden/Tromba and reading assignments are located on a web-based platform called LaunchPad. For details on how to access LaunchPad, go to the Quick Start Guide in the Technical Setup Module.

Homework System (Achieve)

The homework assignments are located on a web-based platform called Achieve. For details on how to access Achieve, go to the Quick Start Guide in the Technical Setup Module.

Grading Policy
The grade in this class is comprised of:

<table>
<thead>
<tr>
<th>Assignment Type</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>On-line Homework (in Achieve)</td>
<td>25%</td>
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<tr>
<td>On-line Quizzes (in Achieve)</td>
<td>10%</td>
</tr>
<tr>
<td>Reading Assignments - Progress Check Questions (in LaunchPad)</td>
<td>15%</td>
</tr>
<tr>
<td>Midterm (online in Achieve)</td>
<td>20%</td>
</tr>
<tr>
<td>Comprehensive Final (online in Achieve)</td>
<td>30%</td>
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Some detailed explanation for the grading is in order:

- **Online Homework:** All online homework assignments are available in Achieve which is accessed directly from each lesson, or you can click on MacMillan Higher Education link in the left NavBar. Due dates are posted in the weekly schedule and are listed in the Syllabus link or in the Calendar link at the top of the page. **You have an unlimited number of attempts on all online homework questions and most questions provide feedback or hints if you answer incorrectly.**

**Words of advice re homework:** Think of the homework as your opportunity to learn the material and expect to spend MANY hours doing homework. The system will provide solutions to many problems for you to check your answers and work, but do not use this to short cut your homework. The process of struggling to find a solution, while possibly aggravating and stressful, is a necessary part in your comprehension of the material for many of you. If you go to the solutions too soon and too often, you may not learn the material well enough to do well on the tests. Good scores on the homework are easy to get, but getting a solid understanding of the material is not easy.

- **On-Line Quizzes:** On-line quizzes take place in weeks 2 and 4 and are found in Achieve. Unlike regular on-line homework assignments, they are limited in time and do not give hints or feedback for incorrect answers. There will be partial credit (where appropriate) on on-line quizzes. Your TA and instructors will check your answers and may assign partial credit after the computer
score has been calculated. That is, your final score on a quiz or other on-line test may be higher than what you see after you submit your test to Achieve. See the schedule below or click on Calendar at the top of the page to find due dates/times.

- **Reading Assignments**: No, we are not watching you when you read, so your reading score is determined by your performance on the progress check questions in the found in various sections in LaunchPad. You have three attempts on each question. You will encounter them regularly when you read the assigned sections in your E-book. All readings are due on the dates noted below in the weekly schedule. You can also find the due dates by clicking on Calendar at the top of the page.

- **Discussion on Piazza and Study Group Participation**: This is a tricky one. Research shows that student success in on-line learning increases with active participation in discussion groups. On the other hand, we understand that not everybody needs help nor may want to collaborate with others. Now if you don't need help, you can still help others, and the fact is that explaining math to others helps you understand the math more deeply, so it is to your benefit also. Active participation on Piazza is strongly encouraged and can contribute to a grade bump for the final grade.

- **Curve**: We do not curve individual tests, but there may be a curve for the class in the sense that grade ranges that lead to certain grades are adjusted based on overall results. In addition, a sufficiently high score on the comprehensive exam is required to pass the course. Similarly, an exceptionally high score on the final exam can lead to a grade bump.

- **Extensions**: There are NO EXTENSIONS beyond the following grace periods and late submission policy:

  A) Reading assignments in LaunchPad, written homework in Canvas and Quizzes and Exams in Achieve: there is a 10 hour grace period and no penalty if you submit your assignment within 10 hours of the due date.

  B) Homework assignments in Achieve: you can submit your assignment late up to five days, with a 10% penalty for each day the assignment is late.

**Accommodations**

Students with disabilities (in particular learning disabilities) should contact one of the instructors during office hours, on-line or virtual, as soon as possible. This is absolutely necessary to insure that there is sufficient time to accommodate your needs to give you an equal chance of success in the course.

If you have questions about disabilities contact the UCSC Disability Resource Center (DRC) at (831) 459-2089 or at [http://drc.ucsc.edu](http://drc.ucsc.edu)
Midterm and Final Exams

Please go to our Exam Information Page in the Course Overview and Policies module for details on Midterm and Final dates, times, locations and requirements. Exams will be unproctored and online in Achieve.

Important: There are no make-up exams given. If you miss the midterm, your score on the final will count for both the midterm and the final. If you miss the final exam, you will fail the class. We CANNOT accommodate individual travel plans. You need to take the final when it is scheduled.

Students often fail to understand that the course ends with the final exam which by its very name is final. Grades cannot be adjusted afterwards for extra work or other reasons unrelated to the actual course.

Tentative Weekly Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Sections to be covered/Tests</th>
<th>Assignments Due</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>6/21 - 6/27</td>
<td>Sections 15.1, 15.2, 15.3, 15.4, 15.5</td>
<td>• Wk 1 Homework and Reading due Tue. 6/29 @ 11:59pm</td>
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<tr>
<td>2</td>
<td>6/28 - 7/4</td>
<td>Sections 16.1, 16.2, 16.3, 16.4 and Quiz 1</td>
<td>• Quiz 1 on Achieve, due Fri. 7/2 @ 11:59pm</td>
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</tbody>
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### Sections Covered

**15. Double and Triple Integrals**

15.1 Introduction  
15.2 The Double Integral Over a Rectangle  
15.3 The Double Integral Over More General Regions  
15.4 Changing the Order of Integration  
15.5 The Triple Integral

**16. The Change of Variables Formula and Applications of Integration**

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[Table of dates and assignments]

- **Wk 2 Homework and Reading due Sun. 7/4 @ 11:59pm**
- **Midterm (online) Friday 7/9.**  
  - Wk 3 Homework and Reading due Sun. 7/11 @ 11:59pm
- **Quiz 2 on Achieve, due Fri. 7/16 @ 11:59pm**  
  - Wk 4 Homework and Reading due Sun. 7/18 @ 11:59pm
- **Wk 5 Homework and Reading due Fri. 7/23 @ 11:59pm**  
  - Final Exam (online) Friday 7/23,
16.1 The Geometry of Maps from $\mathbb{R}^2$ to $\mathbb{R}^2$
16.2 The Change of Variables Theorem
16.3 Applications of Double and Triple Integrals
16.4 Improper Integrals

17. Integrals
   17.1 The Path Integral
   17.2 Line Integrals
   17.3 Parametrized Surfaces
   17.4 Area of a Surface
   17.5 Integrals of Scalar Functions Over Surfaces
   17.6 Surface Integrals of Vector Functions

18. The Integral Theorems of Vector Analysis
   18.1 Green's Theorem
   18.2 Stokes' Theorem
   18.3 Conservative Fields
   18.4 Gauss' Theorem