Math 280: Calculus III
Carl Toews
Spring, 2013

Basics

Where and when
Section A: MF, Thompson 197, 9:00-9:50, TTh, Thompson 197, 8:30-9:20
Section B: MF, Thompson 197, 10:00-10:50, TTh, Thompson 395, 9:30-10:20

Text
Calculus, 2nd Edition, by Jon Rogawski

Course Webpage
http://math.pugetsound.edu/~ctoews/teaching/spring13/calc3/

Instructor
Carl Toews

Contact Info
Office: Thompson Hall 390H
Phone: (253) 879-3839
Email: ctoews@pugetsound.edu
Hours: M 3:00-4:00, T 12:00-1:00, Th 3:00-4:00, Friday 12:00-1:00 and by appointment.

Course Description

Welcome to Math 280, i.e. Calculus III! This course is the last installment in the three-course sequence that started with Math 180 and Math 181. While the focus in Math 180 and Math 181 was on functions of a single variable, the focus in this course will be on functions of two, three, or even more variables. As in the first two calculus courses, our ambition will be not just to acquire a solid technical foundation, but on learning to appreciate Calculus as a logical and aesthetic endeavor in its own right.

Broad learning goals for this course include the following:

• to understand certain core ideas in multivariate calculus

• to become proficient at the computational techniques that derive from these ideas

• to become fluent at communicating mathematics, both on paper and conversationally

• to learn how to independently investigate new and unfamiliar concepts

• to learn how to give and receive feedback on mathematical work gracefully

Course Activities

1. Homework:
   Homework will be assigned daily. In general, I will assign roughly 4-10 problems, posting these problems on the class webpage. In general, the expectation is that you will do the problems before the next class period, and then come to class prepared to present the solutions. If you cannot solve some problem, you are expected to write on your homework some notes describing where you got stuck and why what you tried failed to work. Your solutions will be turned in each day, after discussion. I will pass around felt-tipped pens, and you are free to annotate your work based on the discussion that materializes in class. Depending on how the class flows, I may opt to collect your work on either a daily or weekly basis. Your homework grade will be based on two elements: one, did you attempt all the problems, and two, did you make a reasonable attempt at annotating them? Homework for which the answer to these two questions is affirmative will receive full credit, those lacking in either category will receive somewhat less. I anticipate using a three point scale, as follows:
Weekly Homework Grade:
3 All problems were attempted. Work is mostly correct and complete. Annotations were added where needed and/or appropriate.
2 Either not all problems were attempted, or the attempts were noticeably weak, and annotations were lackadaisical.
1 Work is enduringly and egregiously weak, and annotations conspicuously absent.
0 Worse than any of the above

Daily homework that is turned in late will be marked as such, and the corresponding weekly score will be dropped by one point. At the end of the term, I will drop the lowest two homework scores.

2. Quizzes:
Every Tuesday there will be a quiz that covers the material on which I lectured the previous week. In general, the quizzes are designed to be relatively straightforward extensions of the homework: if you complete and understand the homework, you should do adequately on the quizzes. Quizzes will be graded on a scale from 0 to 10 points, and I will drop the lowest two quiz scores at the end of the term. Do note that I do not allow make-up quizzes: the two dropped quizzes are designed to accommodate necessary absences on Tuesdays (e.g. sporting events, death or illness, etc.) If for some reason your semester is especially ridden with death and horrible illnesses and you need to miss more than two quizzes, talk to me.

3. Exams:
I intend to administer three exams during the course of the semester, spaced at roughly equal intervals. The exams will heavily leverage work you’ve done on the homework and quizzes, i.e. about 80% of the material should be directly analogous. The remaining 20% will consist of conceptual questions or other extensions of the theory.

4. Final Exam:
There will be an in-class, closed book, technology-free final exam during the regularly scheduled final exam period. For Section A, the final is Monday, May 13, 8:00-10:00 a.m., and for Section B, the final is Wednesday, May 15, 8:00-10:00 p.m.

5. Attendance and Participation:
You learn mathematics by doing and discussing mathematics, not by having a teacher tell you how to do it. Active participation in this course is imperative.

There are several ways to be actively involved. The simplest is to attend my class sessions. I will take roll, and your presence (or absence) will be noted. Much of the time we spend in class will be devoted to student presentations of homework solutions. In general, I will call on students randomly to present problems. If you don’t know the answer to one, not a big deal, but if a whole week goes by and you haven’t opened your mouth, either to present, to comment on someone else’s presentation, or to ask a question, you’re doing something wrong.

In general, I will assign a participation grade three times per semester, once for each period of time separating the three in-class exams. I will note who presents, who ask questions, etc., and at the end of the relevant window, I will assign a number between 0 and 3, based on the following rubric:

Participation Grade:
3 Prepared, actively engaged, communicative.
2 Presents a problem, but maybe occasional absences, or very little commentary.
1 Perhaps present, but doesn’t present a problem, and doesn’t offer commentary.
0 Not present, physically or mentally.

Grading
Your final grade will be based on your performance in the various class activities. For each activity, you will be assigned a percentage, and your final grade will be a weighted average of these percentages, with the weights allocated as follows:
Grade Weighting
Participation 10
Homework 10
Quizzes 20
Exams 45
Final Exam 15

Topic List (provisional):

The course essentially consists of Chapters 11-15 in the text. Broadly, the subjects are as follows:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>Parametric equations, polar coordinates, and conic sections</td>
<td>11</td>
</tr>
<tr>
<td>3-4</td>
<td>Vector geometry</td>
<td>12</td>
</tr>
<tr>
<td>5-6</td>
<td>Vector valued functions</td>
<td>13</td>
</tr>
<tr>
<td>7-8</td>
<td>Differentiation in several variables</td>
<td>14</td>
</tr>
<tr>
<td>9-13</td>
<td>Multiple integration</td>
<td>15</td>
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</tbody>
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This schedule and these topics are flexible, however, and I may occasionally change the order of the material if I feel there is a good reason for doing so. (In fact, because I am going to be out of town for the first two days of class, we are starting with Chapter 12, which is slightly smoother than Chapter 11.) A detailed class calendar, as well as class notes, will be updated daily on the class webpage.

Important Dates:
Tuesday, January 29: Last day to add a course, and last day to exercise P/F option.
Monday, February 4: Last day to drop a course without record
Monday, March 4: Last day to drop a course with an automatic W.

Policies

1. Late Work: On-time is better than late, late is better than never. In general, try to get stuff in on time. Homework that comes in after the due date will automatically be reduced by one point. Truly egregious lateness may generate greater penalties, but I’m less interested in giving penalties than I am in having you learn the material, so do the work in any event and hope for the best.

2. Missed Exams: If you need to miss an exam, clear it with me in advance. There are not many valid excuses for missing exams (death is one; there may be others.)

3. Disabilities: If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Peggy Perno, Director of Disability Services, 105 Howarth Hall, 253-879-3395. She will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

4. Class emergency response guidance:
   Please review university emergency preparedness and response procedures posted at www.pugetsound.edu/emergency/. There is a link on the university home page. Familiarize yourself with hall exit doors and the designated gathering area for your class and laboratory buildings.
   If building evacuation becomes necessary (e.g. earthquake), meet your instructor at the designated gathering area so she/he can account for your presence. Then wait for further instructions. Do not return to the building or classroom until advised by a university emergency response representative.
   If confronted by an act of violence, be prepared to make quick decisions to protect your safety. Flee the area by running away from the source of danger if you can safely do so. If this is not possible, shelter in place by securing classroom or lab doors and windows, closing blinds, and turning off room lights. Lie on the floor out of sight and away from windows and doors. Place cell phones or pagers on vibrate so that you can receive messages quietly. Wait for further instructions.