MATH 180, Calculus and Analytic Geometry I
Fall 2009

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Contents

1 Introduction

The prerequisites for this course are high school algebra, trigonometry, and analytic geometry and we will cover the material in Chapters 1-4 and the first four sections of Chapter 5 of our textbook.

Please note that most high school calculus classes move through this material at a much slower pace and often focus on computational skills. On the other hand, university calculus classes move much faster and focus on the underlying principles. So, if you took calculus in high school you probably focussed mostly on "how" while we will focus mostly on "why" and "what".

1.1 Goals

By the end of the semester you should understand the two fundamental ideas of differential and integral calculus: rate of change and infinitesimal accumulation. These two concepts underpin almost all of the technology that we use in our society. In particular, they are fundamental in all of the "hard" sciences (e.g., physics, chemistry, biology, geology, engineering, exercise science) and are also useful in many other disciplines (e.g., economics, finance political science).

During a normal class day we will discuss new material and address questions that arise from reading the text and working on homework problems. New material will be introduced using "simple" examples and I expect detailed in-class discussions to arise after you carefully read the text and work on the homework problems.

To this end, read "How to Study" [4] for an excellent description of how to effectively study, and learn, mathematics.

2 Attendance

Daily attendance is both required and expected. You are also expected to participate fully in class by pre-reading the material to be covered, seeking clarification for unclear points, and engaging in mannerly and academically honest discussions of the topics.

3 Academic Honesty

You are expected to be familiar with the university's policy on Academic Honesty[6] and will be asked to affirm you abide by it on every assignment and exam.

4 Course Information

4.1 Textbook

The textbook is *University Calculus,* by Hass, Weir, and Thomas, ©2007, Pearson Education, Inc.

4.2 Calculator

You will be allowed minimal use of a calculator during tests. I do not care what calculator you use as long as it has the the capabilities for function graphing, numerical equation solving, numerical differentiation, and numerical integration. If you want help, I am most familiar with TI calculators and, if you do not have a manual for your calculator, you should be able to find one on the internet – for example at `http://education.ti.com/us/product/tech/86/guide/86guideus.html`. See [5] in the reference list for the department's calculator policy.

4.3   Basic Information

You can find information pertinent to all of my classes at the link below and, once there, information specific to this class by clicking on the Math 180 link.

`http://math.pugetsound.edu/~bryans/` [1]

4.3.1   Logistics

Classes meet for 50 minutes except on examination days when we meet for 80 minutes.

Professor Bryan Smith	Thompson 390D	879-3562	bryans[at]pugetsound.edu
Math 180A	Thompson 283	M,F	9:00 A.M.
		T, Th	8:30 A.M.
Office Hours		Mon, Tue, Thu	2:00 - 2:50 P.M
		Wednesday	3:00 - 4:30 P.M.
		Other times	by appointment

4.4   Examinations

All examinations are scheduled for Thursday. On test weeks, if there is interest, there will be a review session the night before from 7:00 until 8:15 P.M. Note that the exam period will run for 80 minutes.

There will be four (4) 50-minute, in-class examinations and the lowest score will be dropped. I do not give make-up examinations except for truly exceptional circumstances.

There are copies of old exams on my web site. They might contain typos or even errors. They are offered "as is" for those who wish to use them as a study aid. But they are **not** part of this semester's course.

Examination One	Thursday	September 17
Examination Two	Thursday	October 8
Examination Three	Thursday	October 29
Examination Four	Thursday	November 19

4.5   Final Examination

The final examination is scheduled for

Math 180A   Friday, December 18   8:00 - 10:00 A.M.

The final examination will be comprehensive and cannot be rescheduled so do not plan plane flights (or anything else) that will conflict with it. I will allow you to work longer than the two hours scheduled for the final.

4.6   Writing Projects

There will be 1 to 3 Writing Projects assigned this semester. Designed to help you both better understand the current topic and to develop better writing skills, they will be graded for mathematical content and written presentation as specified in the rubric on the last page of this document.

Note: when working on a writing project you may use any technology that you like (e.g., calculators, Mathematica, MATLAB, etc.) and you may also work with others in solving these problems. There is to be **no collaboration** on the actual writing.

You must include a reference paragraph at the beginning of your paper either affirming the work is completely yours or citing each resource you use: names of participants in discussions (other than in-

class discussions), technological tools, reference texts employed, and anything else other than your own thoughts. Failure to include references is intellectual theft!

4.7   Homework

I will assign homework daily but will not collect it. Each Tuesday we will have a 10-minute, in-class quiz consisting of 2 or 3 of the previous week's homework problems. You are encouraged to bring your worked homework to class and to copy your solutions onto the quiz sheet.

I strongly suggest you do **more** homework problems than I assign.

4.8   Reading

There will be three reading questions associated with each section we cover. You can find these questions on my website at
`math.pugetsound.edu/~bryans/Current/HTML/ReadingQuestions_HassWeirThomas.html`. The reading questions for each section of the book will be due, by email, at 7:00 A.M. on the morning we cover that material in class (there is a daily schedule of what material we are covering on my website). Note these will not be accepted late.

When submitting your answers to the questions use the following structure.

1. Sent to me at bryans(at)pugetsound.edu

2. The "Subject" line must contain "180" followed by the chapter and section. For example, the reading assignment for Chapter 1 Section 1.2 should have "180, 1.2" in it's subject line.

3. Have your full name as the first line of your response.

4. Do not type the questions into your email – just answers.

5. Give very brief answers. Do not include computations for numerical questions but do give brief reasons.

6. Send only pure text. Do not send attachments, WORD files, or graphics. Do not send your answer in HTML if you can avoid it.

7. Mathematical notation is cumbersome in text-only email but don't worry too much about it. I should be able to decipher most reasonable attempts.

I expect you to carefully read the material before we introduce it in class and to ask questions during class about points you do not understand. Your questions will arise naturally if you develop the habit of reading slowly with a pencil and paper at hand.

4.9   Course Information Updates

If you wish, I will periodically post a grade report of your current standing in the class on my university web page. You should keep track of your grades on the various assignments and check them against these reports. Please let me know of any discrepancies.

To have your information posted you need to print your name, the class (MATH 180), and a code on a sheet of paper. Then sign the paper and physically hand it to me. The code is to be a sequence of up to 23 symbols I can type on a keyboard.

4.10   Total Points

In-Class Quizzes	20%
Reading Questions	10%
Writing Projects	10%
Examinations	48%
Final Examination	12%

4.11   First "Reading" Assignment

(Due Thursday of Week 1 at 5:00 P.M.)

1. Look over both my university web page `http://math.pugetsound.edu/~bryans/` [1] and the course webpage for MATH 180 you'll find there.

2. Skim "How to Study" `http://www.cse.buffalo.edu/~rapaport/howtostudy.html`

3. Send an e-mail message to me at bryans [at] pugetsound.edu responding to the points below. Be sure to follow the directions for submitting answers to reading questions (see the Reading section above).

   (a) Tell me your major, if you have one. If not, mention those subjects that interest you the most.

   (b) Tell me which of the suggested techniques in the Rapaport [4] reading seemed obvious to you even though you haven't used them in previous classes.

   (c) Tell me one or two of the techniques in the Rapaport reading that you had never thought of before but that you will try this semester.

   (d) You will hear (or already have heard) that college professors expect you to spend two hours studying outside of class for each hour you spend in class. Why do you think college professors have this expectation?

References

[1] Bryan Smith's Homepage
    `http://math.pugetsound.edu/~bryans/`

[2] Math 180 Course Webpage
    `http://math.pugetsound.edu/~bryans/Current/Fall_2009/180Index_Fall2009.html`

[3] Department Syllabus for MATH 180
    `http://www.math.pugetsound.edu/~matthews/Syllabi/MA180Syllabus.pdf`

[4] William Rapaport's "How to Study"
    `http://www.cse.buffalo.edu/~rapaport/howtostudy.html`

[5] Department Calculator Policy
    `http://www.math.pugetsound.edu/info/calcpolicy.pdf`

[6] University Policy on Academic Honesty
    `http://www.pugetsound.edu/x4718.xml`

5   Math 180 Writing Projects   Grading Rubric

Points	Logic and Mathematics
6	Arguments meet all requirements.
5	Arguments have one minor error, omission or inappropriate inclusion.
3	Arguments have two minor errors, omissions or inappropriate inclusions.
0	Arguments are seriously flawed.

Points	Use of Terminology and Notation
3	All technical terms, concepts and notation are used correctly.
2	Arguments have one lapse in terminology and notation
1	There are minor problems with terminology or concepts.
0	There are major problems with terminology or concepts.

Points	Written Presentation
1	Follows citation requirements and all other writing guidelines.
0	Has lapses in following the guidelines.

5.1   Writing Guidelines

It is best to think of these writing projects as officially assigned papers in which you completely explain and justify your analyses of the problems. You may work with others in solving these problems but there is to be **no collaboration on the written exposition of the solutions.** In addition I expect your papers to be:

1. Fully documented

    (a) You must include a reference paragraph at the beginning of your paper either affirming the work is completely yours or listing each resource you use: names of participants in discussions (other than the in-class discussions), technological tools, reference texts employed, and anything else other than your own thoughts.

    (b) Any idea obtained during brainstorm sessions or in discussions is cited in-line.

    (c) All textbook results (theorems, propositions, and lemmas) are cited in-line and include the name of the result.

    (d) Any use of technology is cited in-line.

2. Carefully handwritten in ink or written with a word processor. (I can show you how to use Scientific Notebook in the labs or you can use Microsoft Word. Please check with me before using any other program.)

3. Written using complete, accurately punctuated sentences.

4. Presented in active voice, the first person plural and with a clear, easy-to-follow expository style.

5. Targeted at an audience consisting of students not in this class but with an equivalent mathematical background – for example, those currently in another section of this course.