

## MTH 251 – DIFFERENTIAL CALCULUS – SYLLABUS

### 1. INSTRUCTOR

**Name:** Brian Sherson  
**Office:** Kidder 108E  
**Office Hours:** TBD  
**MLC Hours:** TBD  
**Email:** shersonb@math.oregonstate.edu

### 2. CLASS INFORMATION

**Meeting Time:** MTWRF 10:00–10:50  
**Location:** BEXL 320  
**Term:** June 22, 2009–August 14, 2009  
**Textbook:** Calculus (4th Ed), by Hughes-Hallett, Gleason, McCallum, et al.  
**Calculator:** TI 83 or 84, HP 48G or 49G or any calculator with graphing functionality. Instructor is more familiar with the HP 49G.  
**Prerequisites:** MTH 111 and 112 with grades of C or better, or placement directly into 251. Students are responsible for knowing the material.  
**Webpage:** <http://shersonb.net/courses/Su-2009/MTH-251>

### 3. GRADING

**Homework:** 10% — Homework will be assigned and collected on a weekly basis. See section 5 on the following page.  
**Spotlight Problem:** 5% — Each student is required to do at least one spotlight problem throughout the term. See section 6 on the next page.  
**Quizzes:** 25% — There will be a quiz every week, unless otherwise specified. See section 7 on page 3.  
**Exams:** 60% — See section 8 on page 3.

Letter grades will be earned as follows:

$$F < 60\% \leq D < 67\% \leq D+ < 70\% \leq C- < 73\% \leq C < 77\% \leq C+ < 80\% \\ 80\% \leq B- < 83\% \leq B < 87\% \leq B+ < 90\% \leq A- < 93\% \leq A$$

### 4. EXPECTATIONS

It is the responsibility of the student, and the student alone to:

- Read their textbook, and not just the exercise sections. The textbook provides examples that may be useful.
- Students who experience difficulty in this class should take advantage of these resources:
  - The instructor.
  - Math Learning Center — Free tutoring is available on a drop-in basis. For more information, visit <http://www.math.oregonstate.edu/mlc>.
  - Collaborative Learning Center — Free tutoring Sunday through Thursday from 7 PM to 10 PM in the Valley Library.
- Request lecture notes from the instructor when the student misses a lecture. A student may request notes from another student, but students are not obligated to share their notes.

- Keep this document for reference.
- Keep cell phones and other electronic devices turned off.
- Students who are determined by DAS (Disability Access Services) as being eligible for accommodations should make an appointment with the instructor by the end of the first week of class.
- Be respectful of everyone in the classroom. Instructor reserves the right to remove disruptive students from the classroom.

## 5. HOMEWORK

- Homework will be given on a weekly basis and is collected on Mondays at the beginning of class.
- Late homework will not be accepted unless an extension has been granted.
- Students who need an extension must request one by e-mail and prepare a valid reason for needing an extension. The instructor will not remember verbal requests for extensions.
- Copying other students' work may help you on your homework, but **not** on your quizzes and tests. Do not expect to succeed in this course if you copy others' homework.
- Use standard  $8\frac{1}{2}'' \times 11''$  paper. **Do not** use spiral notebook paper.
- Use one-inch margins on all four sides. Exercise numbers may be placed inside the left margin.
- Double space all your work. Each exercise should begin on a new line at least 2 spaces **below** the previous exercise.
- No work, no credit.
- Difficult-to-grade homework (e.g., poor handwriting, unclear work, or work crammed together in a small space) will result in a low grade.

## 6. SPOTLIGHT PROBLEMS

Each student is required to write up a solution to at least one spotlight problem to share to the class. Every Tuesday, the instructor will hand out a list of 4 to 6 problems and will ask for students to volunteer. While every student is welcome to work on all the problems, only one student for each problem can be selected to write up a solution to share with the class for credit. Correct solutions are due Friday the same week.

Since a written solution is shared with the class, students should follow these guidelines:

- Hand-written solutions should be written with your best handwriting, and should be double-spaced.
- Since submissions will be photocopied, please use dark pencil or pen, use one-inch margins on all four sides, and use only one side of each page.
- Students are welcome to submit typed solutions. If you are ambitious enough type up your solution, please keep in mind that variables are *italicized*.
- Students should start the first line with "Problem." or "Exercise." and then the problem statement should follow **on the same line**. Students may restate the problem statement.
- A solution should begin "Solution." and follow with a sentence or two describing how the problem is to be solved. We are communicating mathematics, not just writing out a series of equations and expressions.
- All steps must be shown.
- Introduce all your variables and functions (Let  $f$  be a function defined by  $f(x) = x^3$ , and let  $r$  be a positive real number...). In an applied problem, you should describe what your variables and functions represent ( $v$  is a function representing velocity with respect to time...)
- Use first person plural. The idea is that "we" (you and the reader) are solving the problem together.
- A series of equations or expressions should be written in the center of a page in a downward fashion, with equal signs (=) aligned vertically.
- When reasonable, cite theorems and propositions to justify your work (The intermediate value theorem implies...).
- In addition to correct math, students are expected to follow all rules of grammar, spelling, and punctuation. **Only correct solutions will be given credit**, so students are highly encouraged to submit rough drafts to the instructor by Thursday.

## 7. QUIZZES

- Quizzes will be administered every Monday at the beginning of class, unless otherwise specified.
- Unless otherwise specified, quizzes will be worth 10 points, and students will be given 12 minutes.
- A thirty-point differentiation skills quiz will be administered on July 27. Students will be given 30 minutes.
- Students may drop their lowest quiz score, and retake no more than **two** quizzes for up to half the missed points on the first attempt. That is, if a student scores a 4 on a quiz, and then scores 8 on the retake, a score of 6 will replace the first score. A retake can only be arranged *after* a quiz is graded and returned.

## 8. EXAMS

Both exams will have 125 points possible, but will be scored out of 100.

Do not ask me what (or if something in particular) will be on either exam! I will not answer that question. Anything on this syllabus and covered in lecture is fair game.

**Midterm exam:** The midterm exam (weighted as 25% of total grade) is scheduled for July 17.

**Final exam:** The final exam (weighted as 35% of total grade) is scheduled for August 14.

## 9. ACADEMIC DISHONESTY

Academic dishonesty is defined as an intentional act of deception in either cheating, fabrication, assisting, tampering or plagiarism.

**First offense:** Students caught cheating on an exam or quiz will receive a zero. Furthermore, students cheating on a quiz will **forfeit the drop of that zero grade as well as a retake of that quiz.**

**Second offense:** Referral to the Office of Student Conduct.

Grades are earned, not given. The **only reason** to request a grade change is clerical error. Any other reason may be considered academic dishonesty.

## 10. CALENDAR

Monday	Tuesday	Wednesday	Thursday	Friday
June 22 §1.1: Functions, Linear Change	23 §1.6: Polynomial and Rational func- tions §1.2: Exponential functions	24 §1.3: New func- tions from old §1.4: Inverse func- tions	25 §1.5: Trigonomet- ric functions	26 §1.7: Continuity
29 §1.7: Continuity	30 Intermediate Value Theorem §1.8: Limits	July 1 §1.8: Limits Squeeze Theorem	2 §2.1: Rates of Change	3 No class – Inde- pendence Day ob- served
6 §2.1: Rates of Change	7 §2.6: Differentia- bility	8 §2.2: Derivative at a point	9 §2.3: Derivative of a function	10 §2.5: Higher Derivatives
13 §2.5: Higher Derivatives	14 §2.5: Interpreta- tions of the deriv- ative	15 §3.1: Derivatives of constants, scalar multiples, sums, polynomials	16 Review	17 Midterm exam
20 §3.2: Derivatives of exponential functions	21 §3.3: Product and Quotient rules	22 §3.4: Chain Rule	23 §3.5: Derivatives of trigonometric func- tions	24 §3.6: Derivatives of inverse functions
27 Differentiation skills quiz §3.7: Implicit Differentiation	28 §3.9: Linear Ap- proximation	29 §3.10: Theorems about Differentia- bility Mean Value Theo- rem	30 §3.10: Increasing and Decreasing functions Constant functions	31 §3.10: Racetrack Principle
August 3 §4.1: Critical points Local extremum	4 §4.1: Concavity Second derivative test Points of inflection	5 §4.3: Optimization Global extremum Extreme Value Theorem	6 §4.4: Optimization Applied exercises	7 §4.5: Optimization Applied exercises
10 §4.5: Optimization Applied exercises	11 §4.6: Related Rates	12 §4.7: L'Hôpital's Rule	13 Review	14 Final Exam