MATH 180:921
Differential Calculus with Physical Applications
Session 2014S Term 1 (May–June 2014)

INSTRUCTOR

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Class: M 4-5pm; TWThF 4-6pm; (Math Building 100)

Office Hours: Monday, 5-6pm; Wednesdays 3-4pm; or by appointment (please email me to set up an appointment).

UBC Calendar Description: Derivatives of elementary functions. Applications and modeling: graphing, optimization.

Textbook: *Calculus, Early Transcendentals, 7th edition* by James Stewart

COURSE OUTLINE

The topics covered in MATH 180 are listed below. A "Week" represents *approximately* a week's worth of lecture time, not necessarily a calendar week.
Section numbers below refer to the text; most sections of Chapters 2 to 4 and the Course Notes are covered.

- **Week 1**
  - §2.1 The Tangent and Velocity Problems
  - §2.2 The Limit of a Function
  - §2.3 Calculating Limits Using the Limit Laws
  - §2.5 Continuity
  - §2.6 Limits at Infinity; Horizontal Asymptotes
- **Week 2**
  - §2.7 Derivatives and Rates of Change
  - §2.8 The Derivative as a Function
  - §3.1 Derivatives of Polynomials and Exponential Functions
  - §3.2 The Product and Quotient Rules
  - §3.3 Derivatives of Trigonometric Functions
  - §3.4 The Chain Rule
- **Week 3**
  - §3.7 Rates of Change in the Natural and Social Sciences
  - §1.6 Inverse Functions and Logarithms
  - §3.8 Exponential Growth and Decay
  - §3.9 Related Rates
  - §3.5 Implicit Differentiation
  - §3.6 Derivatives of Logarithmic Functions
- **Week 4**

- §3.10 Linear Approximations and Differentials
- Course Notes §1 Taylor Polynomials
- Course Notes §2 Taylor's Formula with Remainder
- §4.1 Maximum and Minimum Values
- §4.2 The Mean Value Theorem

- **Week 5**
- §4.3 How Derivatives Affect the Shape of a Graph (First and Second Derivative Tests)
- §4.4 L'Hopital rule
- §4.5 Summary of Curve Sketching

- **Week 6**
- §4.7 Optimization Problems
- §4.9 Antiderivatives

MATH 180 WEBWORK SITE LINK

About 10 to 20 problems will be posted on WebWork as course-common homework problems every week and will be due the following week. You will need your CWL login and password to access your homework set.

COURSE POLICIES

- There is a **final examination** in June. This exam will account for **50%** of a student's final grade. The remaining 50% will be based on term work. Term work consists of Midterm exams 28% (2 midterms @ 14% each); Quizzes 12%, WebWork Assignments 10%

- **No calculators** or electronic communication devices are allowed at during exams and quizzes. Formula sheets are also not allowed.

EXAM DATES

Quizzes: Tuesday May 20, Monday June 2, Monday June 16.
Midterm Exam 1: Monday May 26
Midterm Exam 2: Monday June 9
Final Exam: Date and location TBA.
Missed Quizzes or Midterms: If a quiz is missed for a documented medical or other reason, it will be ignored. Permission to write a makeup midterm may be granted in the following two circumstances: (a) prior notice of a valid, documented absence (e.g. out-of-town varsity athletic commitment accompanied by a letter from a coach) on the scheduled date; or (b) notification to the instructor within 72 hours of absence due to medical condition. Original written documentation, for example a doctor's note, is required; otherwise, a score of 0 will be given for the missed quiz or midterm.

CHEATING

- UBC takes cheating incidents very seriously. After due investigation, students found guilty of cheating on tests and exams are usually given a final grade of 0 in the course, suspended from UBC for one year, and a notation made on their Transcript of Academic Record.

RESOURCES

The following resources are available for getting help in the course, in addition to your

instructor's office hours:

- **Mathematics Department Tutorial Centre**: Tutors are available, at no charge, to answer questions on a drop-in basis, starting the second week of classes.

- **Stewart Calculus website:** This website, provided by the publisher of the textbook, contains helpful supplements to the text, including reviews of highschool material.
- **AMS tutoring:** The UBC student society provides an assortment of tutoring services.
- **Mathematics Department website:** There is much available under the Undergraduates tab, including recent final exams for most undergraduate mathematics courses.