MATH 104 Differential Calculus with Applications to Commerce and Social Sciences

This is the common Canvas site for MATH 104 and is the source of all central course information, including the course outline, course policies, course study materials, access to online homework, course grades, and general announcements.

Each section of MATH 104 also has its own Canvas site, which is maintained by that section's instructor.

The Instructor-in-Charge for MATH 104 is Professor Mark Mac Lean.

The instructors of the individual sections are:

1. Section 101: Dr. Hannah Alpert
2. Section 102: Professor Yue-Xian Li
3. Section 103: Dr. Shen-Ning Tung
4. Section 104: Dr. Angelos Koutsianas
5. Section 105: Dr. Thomas Budzinski
6. Section 106: Dr. Delphin Sénizergues
7. Section 107: Dr. Ahmad Issa
8. Section 108: Professor Mark Mac Lean
9. Section 109: Dr. Nicolau Sarquis-Aiex

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Important note regarding midterms: Students requesting regrades for their midterms must complete and submit a hardcopy of the regrade request form with their original midterm attached.

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Text:

We use the locally developed CLP Notes: *Differential Calculus Notes* by Joel Feldman and Andrew Rechnitzer. Problems by Elyse Yeager.

Note that there is a mobile friendly version available.

There are also Extra Notes and Problems for a few topics that are not include in the CLP Notes.

Course Outline:

Here is our expected progress through the course laid out in weeks. A week is roughly 3 lecture hours. Note the midterm dates and holidays. Weekly learning goals are linked here each week; click the title of the week.

Week 0 Introduction: Review of Exponentials, Logarithms, and Inverse Functions. Chapter 0, pp.141 to 143 and Appendix A. (Note: students review most material on their own. Lectures will not cover all of it.)

Week 1 A standard business problem from managerial economics. (Notes). An Introduction to Limits. Chapter 1.1 to 1.5.

Week 2 Continuous Functions. Chapter 1.6. The Derivative. Chapter 2.1 to 2.3.

Week 3 Rules of Differentiation I. Chapter 2.4, 2.6. Exponential Functions. Chapter 2.7.

Week 4 Rules of Differentiation II. Trigonometric Functions. Chapter 2.8. The Chain Rule. Chapter 2.9.

Week 5 The Natural Logarithm. Implicit Differentiation. Chapter 2.10 and 2.11.

Note: Thanksgiving Day is Monday, October 14th, which is a holiday.

Midterm on Wednesday, October 16 for MWF sections and Thursday, October 17 for T Th sections.

Week 6 Applications: Elasticity of Demand (Notes). Exponential Growth and Compound Interest. Chapter 3.3. Notes for Continuous Compound Interest.

Week 7 Mean Value Theorem: Chapter 2.13. Related Rates. Chapter 3.2. Optimization I: Maxima and Minima. Chapter 3.5.

Week 8 Optimization Problems. Chapter 3.5.

Week 9 Graphing functions. Chapter 3.6.

Week 10 Graphing Functions. Chapter 3.6. Note: Monday, November 13 is a holiday in lieu of November11th.

Week 11 Approximating Functions with polynomials I. Chapter 3.4.

Week 12 Approximating Functions with Polynomials II. Chapter 3.4. Inverse Trigonometric Functions. Chapter 2.12

Learning Goals:

The learning goals for MATH 104 are found here. More detailed weekly learning goals and coaching notes will be found on this page. You are encouraged to track your progress in mastering these learning goals throughout the term.

Learning Assessment:

Students will be assessed using online homework, in-class midterms and quizzes, section-specific assignments, and a final exam. Individual section instructor will provide more detail about the section-specific assessments.

Grading Scheme:

- Your grade normally will be computed based on the following formula: **50% Final Exam + 20% 1 Midterm1 + 15% WebWork Assignments + 15% Homework, Quizzes, Clicker participation, and other work assigned by individual instructors.** Please note that grades *may be scaled* to ensure fairness across sections and consistency with departmental expectations; this does not mean the distribution will be the same for all sections. The final exam is common to all sections and may be used to normalize grades across sections.
- FINAL EXAM PERFORMANCE REQUIREMENT: **Students need to achieve a minimum of 40% on the final exam to pass MATH 104**. Students who fail the course solely because they have failed to achieve the 40% minimum on the final exam will receive a grade of 47% in the course.
- Passing the MATH 104 final exam may not be sufficient to ensure a student passes MATH 104 if they have failed the term work.

Course Policies:

1. The final examination in December for this course will be common to all sections of MATH 104. This examination will account for 50% of a student's final grade. The remaining 50% will be based on term work. The final examination generally will not be weighted higher for students who perform better on the final examination than they did during the term, although some allowance *may* be made for students who perform *much* better on the final examination than they did during the term. (In practice, this rarely happens and the criterion will be set by the Instructor-in-charge and applied uniformly across all sections.) The final examination is board marked (i.e. all instructors teaching this course mark the exams together) to ensure consistency and fairness across sections.
2. IMPORTANT: The final mark distribution of the term work of each section may be scaled based on the final exam mark distribution of that section. These adjusted term marks would then be used to compute a student's final grade. Any scaling is performed to ensure fairness in the final grades across sections.
3. No unauthorized devices will be allowed at the final examination. This includes cell phones, smart phones, music players, and all other devices. Formula sheets and other memory aids will not be allowed.
4. No calculators will be allowed on midterms or the final examination.
5. **Midterms: There will be one in-class midterm in MATH 104. The date, which is subject to change, is Wednesday, October 16th for MWF classes and Thursday, October 17th for T Th classes.**
6. **Missing midterms:**There are *no make-up midterms* in this course. Missing the midterm for a valid reason normally results in the weight of that midterm being transferred to the final exam. Examples of valid reasons include illness and travel to play a scheduled game

for a varsity team. Examples of reasons that are not valid include conflicts with personal travel schedules or conflicts with work schedules. Any student who misses the midterm is to present to their instructor the Department of Mathematics self-declaration form for reporting a missed assessment to their instructor within 72 hours of the midterm date. This policy conforms with the UBC Vancouver Senate's Academic Concession policy V-135.

Please note that a student who misses the midterm and has otherwise not completed a substantial portion of the term work normally shall not be admitted to the final examination.

7. **Missing the Final Exam:** You will need to present your situation to the Dean's Office of your Faculty to be considered for a deferred exam. See the Calendar for detailed regulations. Your performance in a course up to the exam is taken into consideration in granting a deferred exam status (e.g. failing badly generally means you will not be granted a deferred exam). In Mathematics, generally students sit the next available exam for the course they are taking, which could be several months after the original exam was scheduled. ***Note that your personal travel schedule is NOT a valid reason for missing a final exam and students who miss the MATH 104 exam for this reason will receive a grade of 0 on the exam and fail the course.***

First year can be an overwhelming experience for many students. If you find yourself having serious academic difficulties in this course, it is best to talk to your instructor as soon as you can.

Academic Misconduct:

1. UBC takes cheating incidents very seriously. After due investigation, students found guilty of cheating on tests and examinations are usually given a final grade of 0 in the course and suspended from UBC for one year. More information.
2. While students are encouraged to study together, they should be aware that blatant copying of another student's work is a serious breach of academic integrity. Please discuss with your instructors their expectations for acceptable collaboration on any assigned coursework. Cases of suspected cheating will be investigated thoroughly.
3. Note that academic misconduct includes misrepresenting a medical excuse or other personal situation for the purposes of postponing an examination or quiz or otherwise obtaining an academic concession.

Extra Help:

- Each instructor will hold office hours each week for students in his/her section of MATH 104. These office hours may be by appointment.
- **Math Learning Centre:** There is a Math Learning Centre in LSK 301. Graduate student TAs are there to help you during the posted hours.

Weekly Webwork Assignments:

Each week there will be an online homework set. There is a link for the WebWork assignments in the Course Summary on this page; you should access each assignment from this page to ensure your grade is recorded in the Grade book. **WebWork homework is due at 8:00 a.m. on Wednesdays.** Late assignments are not accepted.

The UBC Vancouver Senate's Academic Concession Policy V-135 applies to all assignments in this course, and students are advised to read this policy carefully.

Note that the intent of homework is to help you learn the material, and therefore it should be done as you are studying. **Data show that students who leave their homework to the night before do poorly in the course.**

Statement on UBC's Policies and Resources to Support Student Success:

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious and cultural observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available here.