

MATH 104 and MATH 184, 2014W

Differential Calculus with Applications to Commerce and Social Sciences

Course information

This is the common page for all sections of MATH 104 and MATH 184 in Term 1 of the 2014W session (September to December 2014). Here you will find the course outline, suggested homework and practice problems, course policies, exam dates, common handouts and supplementary notes, other course information, and information on available resources.

There will be common weekly webwork assignments, and these can be accessed on this page. For section specific assignments and information please go to your own section site linked at the bottom of the page.

There will be three examinations (two midterm exams and one final exam), and the exams will be common to all sections of MATH 104/184. See the information below for examination dates. For section-specific information, please contact your instructor.

MIDTERM EXAM NOTICE

- Midterm exam 1 will be held on October 3 (Friday). The time is from 6:00pm to 7:00pm.
 - A sample midterm 1 is [HERE](#). You should try to do the sample midterm 1 before you use [THE SOLUTION TO MIDTERM 1](#).
 - Midterm exam 2 will be held on November 12 (Wednesday). The time is from 6:30pm to 7:30pm.
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Textbook

The required textbook for this course is *Calculus: Early Transcendentals with student solutions manual*, Volume 1. Fourth custom edition for UBC, by Briggs, Cochran and Gillett. The textbook is available at the UBC Bookstore. ISBN 10 digit: 1-269-91047-7. ISBN 13 digit: 978-269-91047-7. This book is available at the UBC Bookstore.

- Note that there may be differences in page number references and problem numbering between different editions if you use a different edition of the Briggs, Cochran and Gillett textbook. It is up to you to deal with any such potential inconsistencies if you use a different edition of the text.
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Beginning-of-term registration information

- If you are not registered in a section, please do not attend it without the instructor's approval.
- Instructors do not have the authority to "fit you in". Such requests have to be processed by the math department office (Room 121 Mathematics Building). The math department is conducting [registration help](#) sessions in September.

Grading Schemes

- MATH 104: Your grade normally will be computed based on the following formula: 50% Final Exam + 34% 2 Midterms + 10% Webwork Homework + 6% other(section specific).
 - MATH 184: Your grade normally will be computed based on the following formula: 50% Final Exam + 25% 2 Midterms + 10% Math 184 Workshops + 10% Webwork Homework + 5% other (section specific).
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Math 104 Webwork site link

The webwork 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.

Math 184 Workshop site link

The basic information about the Math 184 workshops and also the weekly problems with their solutions can be found on [Math 184 Workshop page](#) .

Exam Dates and Policies

- **THE FINAL EXAM** for this course will be common to all sections of MATH 104 and MATH 184. The exam will take place in December at a date to be announced. **Please do not make end-of-term travel plans before this date has been released.** The final examination is board marked (i.e. all instructors teaching this course mark the exams together) to ensure consistency and fairness across sections.
- **THE MIDTERM EXAMS** for this course will be common to all sections of MATH 104 and MATH 184. There will be two midterms in MATH 104 and MATH 184. The midterm examinations are board marked (i.e. all instructors teaching this course mark the exams together) to ensure consistency and fairness across sections. The duration of each midterm will be 50 minutes. The dates are:
 - **Midterm 1: October 3 (Friday), 6:00pm-7:00pm**
 - **Midterm 2: November 12 (Wednesday), 6:30pm-7:30pm.**
- Midterms are non-cumulative, but the final exam is based on the entire syllabus for the course.
- **Grade calculation:** The 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 will then be used to compute a student's final grade. Any scaling is performed to ensure fairness in the final grades across sections. It is not expected that such scalings would result in significant grade changes.
- **Exam aids:** No unauthorized electronic devices will be allowed in the midterms or in the final exam. This includes calculators, cell phones, music players and all communication devices. Students should not bring their own formula sheets or other memory aids. Formula sheets and other memory aids will not be allowed.
- **Missing midterms:** If a student misses a midterm, that student shall provide a documented excuse or a mark of zero will be entered for that midterm. Examples of valid excuses are an illness which has been documented by a physician and Student Health Services, or an absence to

play a varsity sport (your coach will provide you with a letter). **There will be no make-up midterms, and the weight of the missed midterm will be transferred to the final examination. To be eligible for this arrangement, you must notify your instructor of your failure to take the test within a week of the missed midterm, and come up with a timeline acceptable to both for producing appropriate documentation for your absence.** Please note that a student may NOT have 100% of their assessment based on the final examination. A student who has not completed a substantial portion of the term work normally shall not be admitted to the final examination.

- **Missing the Final Exam:** You will need to present your situation to your faculty's Advising Office 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 (for instance, failing badly normally means you will not be granted a deferred exam). For deferred exams in mathematics, students generally sit the next available exam for the course they are taking, which could be several months after the original exam was scheduled.
 - **Please bring your student ID-s to both midterms and the final.**
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Coursework Policies

- The section specific work that accounts for the remaining 6% or 5% of your coursework grade will be decided by your instructor and may vary from one section to another. This is based on various factors such as lecture times, class size etc.
 - In addition to WebWork problems, a list of suggested practice problems will appear on this website every week. These are not to be turned in and will not be graded. It is however strongly recommended that you work through these problem sets as they are based on the syllabus for this course, and therefore omit problems that may be in the text but are unrelated to the course material. They also accurately reflect in terms of content and level of difficulty the problems you will encounter in midterms and the final.
 - **Late Assignments:** WebWork will automatically close at a previously announced time specified by the instructor, so it is important to finalize and submit your work by that deadline. It will not be possible to obtain extensions on WebWork assignments.
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Academic misconduct

- 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](#).
 - 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.
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Individual section links

- [Section 101 of MATH 104](#) T-R 2-3:30 pm MATH 100 (Instructor: Li, Dong)
- [Section 102 of MATH 104](#) M-W-F 9-10am Mathematics 100 (Instructor: Chau, Albert)
- [Section 103 of MATH 104](#) M-W-F 11-12pm BUCH A201 (Instructor: Liu, Keqin)
- [Section 104 of MATH 104](#) T-R 8-9:30am LSK 201 (Instructor: First, Uriya)

- Section 105 of MATH 104 M-W-F 9-10am MATX 1100 (Instructor: Hambrook, Kyle)
 - Section 106 of MATH 104 T-R 2-3:30pm LSK 200 (Instructor: Ao, Weiwei)
 - Section 108 of MATH 104 M-W-F 11-12pm Buchanan A202 (Instructor: Bergeron, Maxime)
 - Section 109 of MATH 104 T-R 3:30-5pm Buchanan A201 (Instructor: Brakocevic, Miljan)
 - Section 101 of MATH 184 M-W-F 12-1pm Buchanan A203 (Instructor: Lee, Chia)
 - Section 102 of MATH 184 M-W-F 3-4pm MATH 100 (Instructor: Lee, Chia)
 - Section 103 of MATH 184 M-W-F 4-5pm LSK 201 (Instructor: Williams, Ben)
 - Section 104 of MATH 184 M-W-F 12-1pm LSK 201 (Instructor: Ruping, Henrik)
 - Section 105 of MATH 184 T-R 3:30-5pm MATH 100 (Instructor: Liu, Keqin)
 - Section 106 of MATH 184 M-W-F 3-4pm LSK 201 (Instructor: Bradshaw, Zachary)
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Help outside class

- Each instructor will hold a few (2-3) office hours per week for students in his/her section. See section website for more details.
 - Drop-in Tutorials: There is a drop-in tutorial centre whose operating schedule and venue for this semester will be posted [here](#). The tutorial centre typically starts from the second week of classes. Graduate student TAs are there to help you during specified times.
 - The AMS offers [tutoring services](#).
 - **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.**
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Course Outline

- MATH 104 and MATH 184 are courses in differential calculus, with applications and examples drawn primarily from business and economics. These courses are equivalent in technical content to MATH 100/180/102 and serve as a pre-requisite for any of MATH 101/103/105. The text book for MATH 104/184 is Single Variable Calculus: Early Transcendentals, First Edition, by Briggs and Cochran. Any supplemental notes for specific topics will be posted on the main course website.

Please note that "Week" below typically means 3 lecture hours, but this will vary. There are two common midterms scheduled in the term, and both will take place in the evening. This course is heavily coordinated, but individual instructors will have their own style. Be assured that the content taught will be the same across all sections in spite of this, and that all sections will be prepared for the common midterms and common final exam.

- Here is a week-by-week schedule of course material based on the appropriate sections of the text. The chapter and section numbers are from the second custom edition of the textbook. Follow the links for each week to get a more detailed description of the concepts covered that week, and for the learning objectives that you should use as self-checks.
 - **Week 0** Introduction: Review of Exponentials, Logarithms, and Inverse Functions. Chapter 1.3
 - **Week 1** A standard business problem from managerial economics. (Notes). An Introduction to Limits. Chapter 2.1, 2.2, and 2.3 (to the end of Quick Check 3 on p. 74)
 - **Week 2** Continuous Functions. Chapter 2.6 (to p. 101 plus the intermediate Value Thm).

- The Derivative. Chapter 3.1, 3.2
 - **Week 3** Rules of Differentiation. Chapter 3.3, 3.4. Chapter 3.5: only the table of derivatives Theorem 3.13 on p. 167. (We return to this section at the end of the course.)
 - **Week 4** Derivative as rate of change. Chapter 3.6. The Chain Rule. Chapter 3.7
 - **Week 5** Implicit Differentiation. Chapter 3.8 to the end of the section on Slopes of Tangent Lines, plus material on the power rule with rational exponents. Derivatives of Logarithms and Exponentials. Chapter 3.9
 - **Week 6** Derivatives of Logarithms and Exponentials Continued. Chapter 3.9. Applications: Elasticity of Demand (Notes to be posted online). Exponential Growth and Compound Interest. (Chapter 6.8 to the end of Example 3 plus online notes.).
 - **Week 7** Related Rates. Chapter 3.11. Maxima and Minima. Chapter 4.1
 - **Week 8** Information in the first and second derivatives. Chapter 4.2. Asymptotes from Chapter 2.5. Graphing functions. Chapter 4.3
 - **Week 9** Optimization problems I. Chapter 4.4
 - **Week 10** Optimization Problems Continued. Chapter 4.4. Linear Approximation. Chapter 4.5
 - **Week 11** Approximating Functions with polynomials Chapter 9.1
 - **Week 12** Approximating Functions with polynomials Continued Chapter 9.1. Inverse Trigonometric Functions. Chapter 3.10
 - Week-by-week detailed learning goals
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Supplementary notes

- A business problem for week one
- Here are some notes on Elasticity of Demand , notes on Compound interest and section 6.8 for week 6
- Here are some (for week 6 and week 7)

problems on Elasticity of Demand and on Continuous Compound Interest(with answers) ,

problems on Related Rates in business (with answers)

Practice problems

This section contains a list of problems from the textbook. These are not to be turned in, but working through them will help crystallize the concepts covered in class. Not all parts of a textbook section will be emphasized equally in lectures, and these problems serve as guidelines for identifying the important and relevant parts that constitute the course syllabus. Exam questions will be largely modelled on these problems.

- Section 1.3: 3, 5, 11, 15, 17, 19, 25, 27, 29, 41, 43, 45, 53, 55, 70, 71, 72, 73, 79, 81, 91.
- Section 2.1: 3, 5, 7, 11, 15, 29.
- Section 2.2: 2, 5, 10, 11, 21, 23, 27, 29, 43.
- Section 2.3: 5, 10, 26, 29, 33, 34, 37, 40, 41, 46, 47, 51, 68.
- Section 2.6: 8, 10, 18, 23, 39, 58, 65, 84, 85.
- Section 3.1: 2, 10, 23, 56, 63.
- Section 3.2: 9, 10, 15, 19.
- Section 3.3: 19-24, 28, 33, 36, 38, 41, 54, 62, 72, 79.
- Section 3.4: 7-14, 15, 31, 34, 51, 54, 59, 60, 72, 85, 87.

- Section 3.5: 6, 17-28, 46, 62, 66.
- Section 3.6: 7, 10, 11, 12, 20, 21, 35, 41, 42, 46, 47.
- Section 3.7: 2, 4, 5, 6, 35, 36, 38, 50, 51, 52, 79, 81, 82, 88, 93, 99, 100.
- Section 3.8: 2, 3, 10, 12, 18, 24, 27, 28, 51, 54, 56, 60, 61, 75,
- Section 3.9: 1, 2, 6, 12, 16, 19, 54, 57, 60, 65, 68, 97, 105.
- Section 6.8: 1, 10, 11, 13, 16, 25, 30, 38
- Section 3.11: 3, 10, 15, 19, 22, 24, 29, 46.
- Section 4.1: 1, 4, 5, 7, 8, 10, 13, 14, 20, 24, 30, 31, 33, 52, 54, 58, 61, 62, 66, 79.
- Section 4.2: 1, 2, 3, 12, 16, 22, 34, 40, 46, 47, 50, 60, 64, 68, 70, 79, 80, 97, 98, 100.
- Section 2.4: 9, 11, 17, 19, 21.
- Section 2.5: 28, 32, 52, 53, 57, 68.
- Section 4.3: 2, 3, 8, 13, 19, 25, 30, 35, 36, 48, 49, 70.
- Section 4.4: 2, 3, 4, 6, 15, 17, 21, 22, 26, 29, 31, 37, 39, 54, 61, 63.
- Section 4.5: Quick Checks: 1-4; Exercises: 2, 3, 4, 15, 16, 18, 24, 26, 30, 37, 38, 47, 51, 57, 61, 63.
- Section 9.1: 1, 2, 6, 9, 11, 17, 21, 31, 39, 42, 43, 73.
- Section 3.10: 7-12, 22, 26.