

Course Outline MATH 100 (Calculus I), Summer 2009

Course Description:

This course is the first in a two-course (MATH 100 and MATH 101) introduction to single variable calculus intended for students who plan to specialize in one or more of mathematics, statistics, physics, chemistry, computer science, engineering, economics (in the B.Sc. program), or mathematics education (secondary program). Course content includes the following: review of analytic geometry; functions and graphs; limits; derivatives; techniques and applications of differentiation; antiderivatives; the definite integral and area; logarithmic and exponential functions; trigonometric functions; Newton's, Simpson's and trapezoidal methods.

The prerequisites for this course are one of the following: Minimum grade of B in Principles of Mathematics 12 or equivalent, or passing score in Mathematics Placement Test, or MATH 120. Your official student record will determine if you have to write a placement test. You will be notified in the first class if you have to take this exam.

What is the difference between MATH 100 and MATH 102?

The course MATH 102 covers less material and proceeds at a slower pace than MATH 100. It does not require the level of skill with algebra and trigonometry that a student needs in order to complete MATH 100 successfully.

Which of MATH 100 and MATH 102 should you take?

If you are not sure which of MATH 100 and MATH 102 you should take, then, if you know the subject you want to study, read the mathematics requirements specified in the Calendar by the department that teaches that subject, otherwise ask for assistance in making your choice at the Advising Centre in University Centre A-205.

Credit cannot be obtained for both MATH 100 and MATH 102.

If you take and pass both MATH 100 (a 1.5-unit course) and MATH 102 (a 1.5-unit course), you will receive only 1.5 units of credit in total.

Instructor:

Stephen Benecke
Office: SSM A455
Office Hours: MW 2:00 - 3:00
Phone: 250-472-5314
Email: stephen.benecke@gmail.com

Students are encouraged to approach the instructor if they wish to discuss any aspect of the course, either during office hours or by appointment.

Assistance Centre:

If the instructor is unavailable and you need assistance, you may go to the Mathematics Assistance Centres which are located in Room A202 in the Social Sciences and Mathematics (SSM) building, and in the C.W. Lui Learning Commons in the main Library. Hours of operation for the Mathematics Assistance Centres will be announced on the department website (<http://www.math.uvic.ca>, Assistance Centre). These hours are subject to change. It is staffed by able mathematics graduate students who are paid to help you.

Review:

It is important for you to understand that, for most people, mathematical skill deteriorates rapidly when it is not used. You should work through sections 1.1, 1.2, 1.3, and 1.4 and Appendices A, B, C, and M of the textbook, which review some of the material with which you will need to be adept. You are expected to know and understand everything in these Appendices. If necessary, work through as many of the problems at the ends of these sections as you can and certainly work all the odd numbered problems. Have this completed before the end of the first week of classes.

Timetable:

Meetings occur for a total of 4 hours per week, with tutorials on Mondays (as indicated below). The first lecture is on Tuesday, May 5, and the last lecture is on Friday, July 31. The first tutorial is on Monday, May 11, and the last tutorial is on Monday, July 27.

Lecture Timetable:

Day	Time	Venue
Tuesday	10:30 - 11:20	ECS 116
Wednesday	10:30 - 11:20	ECS 116
Friday	10:30 - 11:20	ECS 116

Tutorial Timetable:

Day	Time	Venue
Monday	11:30 - 12:20	ECS 116

Course Material:

The following textbook will be used throughout this course:

C.H. Edwards & D.E. Penny, *Calculus: Early Transcendentals (Matrix Version)* (7th ed), Prentice Hall, Upper Saddle River (NJ), 2008 [ISBN 0-13-156989-9].

References will be made to the seventh edition, which is available in the Bookstore. However, students can use the fifth or sixth edition which differs little from the seventh edition. Copies of the Instructor's Solutions Manual that contains detailed worked solutions for most of the problems in the text have been placed in the Reserve Reading Room of the Library.

Students are **only** allowed to use the **Sharp EL-510-R** calculator. **No other calculators will be allowed during examinations.** These calculators may be purchased in the UVic Bookstore.

Course Webpage:

Students are encouraged to visit the course webpage on a regular basis. Besides the fact that the homework assignments will be posted here, it is also a useful tool to convey important information regarding the course. The page is accessible through the Department website, under "Course Pages", or through the instructor's website at <http://www.math.uvic.ca/~stephen/index.html>.

Course Assessment:

There will be two midterm tests on the dates shown below. Each of these tests contributes 15% to the final grade. Note that each test covers approximately one half of the material. In addition, assignments will be presented throughout the term. Each assignment contributes 2.5% to the final grade, for a total of 10%. The final examination contributes 60% to the final grade.

Assessment Opportunity	Percentage
Test 1 (June 9)	15%
Test 2 (July 28)	15%
Assignments	10%
Final (TBA)	60%

Once marked, midterm tests will be returned in class, or may be claimed during office hours. There will be no make-up tests. If a student misses a test due to reasons in accordance with the regulation on Illness, Accident or Family Affliction, the instructor should be notified as soon as possible. A written request to be excused, as well as the relevant supporting documentation, should be submitted within 10 working days after the test date. In such cases the final exam score will be used to assign a score for the missed test.

Students are strongly advised to **not** make final plans for travel or employment during the exam period, since special arrangements will not be made for examinations that may conflict with such plans.

Questions or concerns regarding graded test or assignment papers should be brought to the attention of the instructor within 7 calendar days of the date when it was returned. Grades may be posted by student number on the website. If a student wishes to be excluded from this posting, the instructor should be notified in writing.

The nature of what you will be expected to do on the tests and final examination is largely defined by the problems from the text listed in the Course Outline and Suggested Problems (below), as well as the in-class examples.

Students are **only** allowed to use the **Sharp EL-510-R** calculator. **No other calculators will be allowed during examinations.** Students are not allowed to use a “help” or “formulasheet” and may not have in their possession during a test any paper other than what is provided to you by the invigilators. Candidates found communicating with one another in any way, or having unauthorized books, papers, or communication devices such as cell phones and PDA’s in their possession, will be considered in violation of the University Policy on Academic Integrity.

Assignments:

There will be 4 Homework Assignments presented throughout the course, according to the schedule below. These assignments test the student’s understanding of the various mathematical concepts and his/her ability to answer various questions based on the course material. The assignments are to be handed in at the start of the session in which they are due.

Note that late assignments will not be accepted.

Homework Assignment	Available	Due
Assignment 1	Friday, May 8	Friday, May 22
Assignment 2	Friday, May 22	Friday, June 5
Assignment 3	Friday, June 12	Friday, July 3
Assignment 4	Friday, July 10	Friday, July 24

The assignments as well as solutions will be posted on the course webpage according to the above schedule. Students are encouraged to check the website regularly for updates. Please note that unclaimed tests will only be retained until

August 31st, 2009. All unclaimed work will be destroyed after this date.

Tutorials:

Tutorial sessions will be conducted on Mondays at 11:30 in ECS 116. These sessions form a crucial part of the course presentation.

- Material which is introduced in the lectures will be explained further in the tutorials by way of additional examples. There may also be opportunity for students to discuss problems in small groups.
- Some of the minor topics may only be presented in the tutorials, so it is very important for students to attend both the tutorials and the lectures.

Test Dates:

The two midterm tests will take place during normal lecture sessions on the following predetermined dates. Students will be allowed 50 minutes to complete the test.

- Test 1: Tuesday, June 9, 10:30 - 11:20 ECS 116
- Test 2: Tuesday, July 28, 10:30 - 11:20 ECS 116

Final Examination:

The final examination will be scheduled by Records Services to occur during the formal examination period. The date and time of this examination will be posted on official University Bulletin Boards at least two weeks before the beginning of the formal examination period. Students must write the final examination on the date and time published by Records Services unless they qualify for a deferred examination as outlined in the UVic Calendar.

Students are expected to attend all lectures and the course will be conducted on that basis.

This document is prepared several weeks before the beginning of classes. It is possible that some of the information in it will have to be modified as the term progresses. Any such changes will be announced in class and the web version of this document will be updated. If you miss such an announcement because you did not attend class, you must accept the consequences of not having learned of the change.

Suggested Exercises:

Students are strongly encouraged to attempt as many of these exercises as possible, as soon as the corresponding material is discussed in class. Suggested Exercises for earlier editions of the textbook may be found on the course web page.

Section	Seventh Edition
2.1 Tangent Lines	odds 1–13; odds 15–23; 25–28; odds 29–35.
2.2 The Limit Concept	odds 1–17; odds 19–27; 29–36; odds 37–45.
2.3 More About Limits	odds 1–23; 25; 26; 27; 28; odds 29–47; odds 49–57.
2.4 Concept of Continuity	odds 1–7; 9–14; odds 15–35; odds 37–47.
3.1 The Derivative & Rates of Change	odds 1–9; odds 11–19; odds 21–29; odds 37–51.
3.2 Basic Differentiation Rules	odds 1–49.
3.3 The Chain Rule & Related Rates	odds 1–11; odds 13–19; all 21–25; odds 27–35. odds 37–43; all 45–48; odds 49–61.
3.4 Derivatives of Algebraic Functions	odds 1–43; all 45–50; all 51–55.
3.5 Max. & Min. on Closed Intervals	odds 1–9; odds 11–21; 28; 29; 30; 33; 35; 37; all 47–52.
3.6 Applied Maximum-Minimum	odds 1–41.
3.7 Derivatives of Trig. Functions	odds 1–19; odds 21–59; 75; 76; 77.
3.8 Exponential & Log. Functions	odds 1–37; odds 39–45; odds 47–61.
3.9 Implicit Differentiation & Related Rates	odds 1–9; odds 15–27; 35, 36, 37; odds 39–57.
3.10 Successive Approx. & Newton's Method	odds 1–19; 29; 32, 33.
4.2 Differentials & Approximations	odds 9–15; odds 17–23; odds 25–33; 40, 41, 42; 49, 50.
4.3 Increasing & Decreasing Functions	1; 3; 5; 7; 9; odds 11–23 & 18.
4.4 The First Derivative Test	odds 1–15; odds 17–25; odds 27–41.
4.5 Simple Curve Sketching	odds 1–9; odds 15–47.
4.6 Higher Derivatives & Concavity	odds 1–15; odds 17–21; odds 23–29; odds 31–49; odds 51–61; odds 63–75; all 77–82.
4.7 Curve Sketching & Asymptotes	odds 1–15; odds 17–27; odds 29–53.
4.8 Indeterminate Forms	odds 1–29;
4.9 More Indeterminate Forms	odds 1–19; 20–24.
5.2 Antiderivatives & Initial Value Problems	odds 1–29; 31, 32, 33; odds 35–45; odds 47–51; 57, 59.
5.3 Elementary Area Computations	odds 9–17; odds 19–27; 29, 30; odds 31–37.
5.4 Riemann Sums and the Integral	odds 1–9; odds 11–15; 21, 23.
5.5 Evaluation of Integrals	odds 1–35.
5.6 Average Value & Fundamental Theorem	1, 3, 5; odds 13–27; 29, 31; odds 33–39; 41, 43, 45; 51–59; 61, 63.
5.7 Integration by Substitution	odds 11–49, 51–63.
5.8 Areas of Plane Regions	odds 1–9; odds 11–19; odds 21–41.
5.9 Numerical Integration	odds 1–6; odds 13–25.