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COURSE OUTLINE MATH 100: Calculus I, Fall 2019

Instructors

Dr. Muhammad Awais

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General Course Information

Number of Units 1.5

Note: Credit will only be granted for one of MATH 100, MATH 102, MATH 109.

Pre-requisites One of MATH 120 with a minimum grade of C+, Pre-Calculus 12 with a minimum grade of B (73%), Principles of Mathematics 12 with a minimum grade of B (73%), or permission of the department. *Note: it is recommended that students have a passing grade in Calculus 12 or equivalent course prior to MATH 100, as MATH 100 is taught expecting prior exposure to calculus.*

Office Hours and Assistance

(starting from September 9, 2019 until December 4, 2019)

Dr. Muhammad Awais: Wed 10:30-11:30am and Fri 10:30-11:30am in DTB A533.

Dr. Trefor Bazett: Tue 10:00am - 11:30pm, and Wed 11:30am - 12:45pm in DTB A450.

Note: You are welcome to attend the office hours of either instructor.

Drop-in Help: The Mathematics & Statistics Assistance Centre is a large space where students can go to work, on their own or in groups, and to discuss math & stats problems. The Centre is staffed with talented Teaching Assistants who are happy to discuss primarily first and second year course material with you. Please see <http://www.uvic.ca/science/math-statistics/current-students/undergraduate/msac/> for more information.

Math Club: Consider joining Students in Undergraduate Mathematics and Statistics (SUMS)

Please see <http://www.uvic.ca/science/math-statistics/current-students/undergraduate/sums/index.php> for more information.

Learning Objectives

Calculus is the study of change. The differential side of calculus studies rates of change, how one variable is affected by changing another. The integral side studies accumulations of changes. Calculus can deal with quantities becoming infinitely large, or changes that are infinitesimally small. This theory is incredibly powerful, and used throughout mathematics, science, engineering, and beyond. Indeed, Calculus is a prerequisite for an enormous number of future courses.

Math100 is intended for students who have previously been exposed to calculus (Math109 is for those who haven't). As we explore Calculus in a university level context, we may go further than your prior exposure. We will not just execute procedures, but will build conceptual understanding, develop our problem solving skills, and communicate and collaborate as we dig deeper into Calculus.

Please consult the Course Pack (see below) for a detailed list of Learning Objectives.

Course Material and Online Resources

Textbook: *Thomas' Calculus Early Transcendentals, 14th Edition*, Weir and Hass, published by Pearson/Prentice Hall. You may purchase a print copy of the textbook packaged together with access to MyMathLab (see below) from the UVic bookstore. If you do not want a print copy, you are not required to purchase one – MyMathLab comes with an e-book version of the textbook.

MyMathLab (MML): This is a required tool, which you will use to study the material and complete weekly assignments. If you purchased the text bundled with access to MML then you do not need to purchase an MML access code. If you did not purchase a new print copy, then you must purchase an access code to MML separately. MML access codes are available at the UVic bookstore. MML comes with an e-book version of the text and an e-book version of the **Student's Solution Manual**. You may access MML for a free 14-day trial if you are not yet ready to purchase it; as long as you eventually purchase access, your work and scores will be preserved.

Course Pack: You must purchase a course pack for this course from the UVic bookstore. This course pack includes, among other things, all of the worksheets that you will be working on in your tutorials. You must therefore bring this course pack with you to each tutorial (see below).

Course webpage: The course webpage is on <http://coursespaces.uvic.ca>. We will make frequent use of CourseSpaces to post course announcements, the pre-class modules, answer student questions, and record student grades. It is your responsibility to read announcements posted on CourseSpaces. If you do not have regular access to your own device that can access CourseSpaces, you can use one of the many computers available to students on campus.

Calculator: Calculators are allowed in exams, but the only acceptable calculators to be used are a Sharp Calculator with a model number starting with “EL-510R”. It may



be purchased at the UVic Bookstore for about \$15.

Class Components

PreClass Modules: We strongly recommend that you prepare for each class. Before most classes, there will be an online module containing video and/or readings assignments, as well as a short online quiz (collectively worth 5%) that provides you (and us) with feedback on your understanding of the assigned material. The module helps to establish the foundational ideas for each section. With this foundation established, you will be better equipped to understand the subsequent class where we will tackle higher level learning objectives.

We will teach with the expectation that students have worked through the pre-class module, and will not generally be repeating that content. As most of you will have seen Calculus previously, it is possible these topics will be familiar to you. If they are, and you can quickly and easily complete the quiz, great. However, we caution that students often overestimate their retention and understanding from prior Calculus courses and taking the pre-class modules seriously is important. On the other hand, if the modules feel challenging, that is also ok, as at this point we are still early on in the learning process and mastery is not yet expected. **The lowest three PreClass quizzes will be dropped.**

Class: During class we will build on the foundation laid before class. We will dig deeper into the concepts, analyze them, and apply them in new situations. Class time will not solely be spent with the instructor lecturing. A portion of class will involve students working either individually or collaboratively on problems. Attendance in class is expected, except in the case of illness, accident, family affliction, or religious observation. You should take notes during lecture; they will not be provided for you.

Tutorials: All tutorials meet on Mondays, but your time depends on your tutorial section. Tutorials are mandatory supplements of the lectures, and are as important as lecture. You will spend each tutorial working with the TA on tutorial worksheet questions that are similar to some of the midterm and final exam questions. Your tutorial TA will facilitate group's discussion by asking probing questions, guiding the discussion, and answering questions (sometimes with another question).

You must attend the tutorial for which you are registered, as the tutorial TA will collect a short 'Exit Ticket' at the end of each tutorial collectively worth 1% of your course grade. These Exit Tickets are marked on the basis of meaningful completion only.

Online Homework/Quizzes: The online homework/quizzes are completed through the Pearson MyMathLab (MML) system that complements the textbook. They are collectively worth 7% of your grade, and come in two phases: first homework, then quiz. The homework is not for a grade itself. However, you must score 75% on the homework before being able to access the corresponding quiz, which will contain questions of comparable difficulty. The homework is due at 10:59pm on Thursdays, and the



amount of time it takes to complete typically varies a lot by student so leave yourself plenty of time. The 30 minute corresponding quiz is then due at 11:59pm on Thursdays. You are expected to complete the quiz on your own without any outside assistance.

The purpose of the homework is to practice your skills, with instant feedback so you can gauge your own level of understanding. For most problems, you will be able to attempt it an unlimited number of times, and you will have access to the “Help Me Solve This” and “View An Example” buttons. You are also free to get help from other students, the Math & Stats Assistance Centre, and the instructors’ office hours. The purpose of the quiz is to provide you with a formative feedback about your internalization of the studied material, in preparation for the upcoming examinations. Note that you can continue to work on assignments after they are due, but will not have access to the quizzes after they are due. **Your two lowest scores on weekly quizzes will be dropped.**

Evaluation and Grading

Your final percentage grade will be computed according to the following scheme.

Components	Dates	Weights
Weekly MML HW assignments/ follow up Quizzes	Most Thursdays	7%
Pre-class quizzes	Before most lectures	5%
Tutorial ‘Exit Tickets’	Most Tutorials	1%
Midterm 1	Sept 30 in Tutorial	15 %
Midterm 2	Oct 28 in Tutorial	15 %
Midterm 3	Nov 25 in Tutorial	15 %
Final Examination	TBA	42%

Grading Percentage scores will be converted to letter grades according to the university-wide standard table

<http://web.uvic.ca/calendar2019-09/undergrad/info/regulations/grading.html>.

Midterms: Each midterm is 45 minutes long, and take place during tutorial. Your midterms will be returned to you in your tutorial.

Final Examination: Off-schedule final examinations (i.e., deferred examinations) are given only in accordance with the university policy as outlined in the Calendar. If you are unable to write a final examination due to illness, accident or family affliction, please refer to the following webpages for detailed instructions how to proceed: <http://web.uvic.ca/calendar2019-09/undergrad/info/regulations/concessions.html> and <http://web.uvic.ca/calendar2019-09/undergrad/info/regulations/exams.html>. Students are **strongly advised not to make plans for travel or employment during the final examination period** as special arrangements will not be made for examinations that conflict with such plans.

Supplemental Examinations: The Department of Mathematics and Statistics does not award ‘E’ grades or offer Supplemental Examinations in any of its courses.

Accessibility: Students with diverse learning styles and needs are welcome in this course.

In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the Centre for Accessible Learning (CAL) as soon as possible. The CAL staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations <http://www.uvic.ca/services/cal/>. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

Commitment to Inclusivity and Diversity: The University of Victoria is committed to promoting, providing and protecting a positive, supportive and safe learning and working environment for all its members.

Policies and Ethics

Specific to Math 100:

Missing midterms: No midterm extensions or make-ups will be offered. If you are unable to write a midterm for reasons such as serious illness, family affliction, or religious observation, then you must provide adequate documentation to your instructor as soon as possible, no later than 7 days after the missed midterm. If you have an approved miss of a single midterm, your final exam score will replace your missed midterm score. If you have an approved miss of more than one midterm, it is expected that you have a consultation with Dr. Trefor Bazett, and your midterm weights will be redistributed to the other course components with the final worth no more than 60%.

Missing tutorial If you are unable to attend a tutorial for reasons such as serious illness, family affliction, or religious observation, then you must provide adequate documentation to your lecture instructor as soon as possible.

Missing PreClass Quizzes: There are no extensions or makeups. To reduce the logistical challenges for this frequent component of the course, three drops of incomplete preclass quizzes will be automatically applied to every student. That is, you don't need to bring in documentation of an excused absence like an illness on a specific day as you will get the three drops regardless, and won't get more than three drops because of this single absence. In the circumstance of a series of legitimate absences, or a particularly long one, then you will need to provide documentation to Dr. Trefor Bazett to consider more than three drops.

Missing MML homework/quiz: No extensions or make-ups will be offered. Everyone gets a default of two dropped quizzes. If you are unable to complete a homework assignment and/or quiz/test due to technical difficulties then that quiz will be one of the two that are dropped. You are expected to begin early, and ensure technical difficulties are resolved. If you have a known conflict with the due date, such as a religious observance, then it is expected you complete the homework and quiz early if possible. If you are unable to complete a homework or quiz due to an unanticipated or prolonged conflict such as a serious illness or family affliction, then you must provide adequate documentation to your instructor as soon as possible, and if approved you will gain an additional dropped quiz.

Unclaimed Midterm Exam Papers: will be recycled after the course is over.



Midterm Re-mark requests: If you believe that your midterm has been incorrectly marked, you must write a short (at most 1 page) explanation and staple it to the front of your midterm. This request must be submitted **in lecture** no later than one week after midterms are returned to you. Late re-mark requests, or requests submitted outside of lecture, will not be considered except in the case of absence due to serious illness or religious observance. After the course grade has been assigned, no requests to review term work grades to bump up the score will be considered or responded to.

Course grade bump up requests: We will not respond to any requests to increase an assigned grade just because the assigned grade is below the desired one. The only correct way to request a review of an assigned course grade is by officially requesting a grade review:

<https://www.uvic.ca/registrar/assets/docs/record-forms/grade-review.pdf>

Departmental Policies:

(See <https://www.uvic.ca/science/math-statistics/current-students/undergraduate/course-policies/index.php> for more information.)

Attendance: The university Calendar states ‘Students are expected to attend all classes in which they are enrolled.’ (see <http://web.uvic.ca/calendar2019-09/undergrad/info/regulations/attendance.html>). Our courses are conducted on that basis. If you miss an announcement (information concerning midterms, corrections to assignment, etc.) because you did not attend class, you must accept the consequences of not having learned of the change.

Guidelines on Religious Observances: Where classes or examinations are scheduled on the holy days of a religion, students may notify their instructors, at least two weeks in advance, of their intention to observe the holy day(s) by absenting themselves from classes or examinations. Instructors will provide reasonable opportunities for such students to make up work or missed examinations.

Academic Integrity: Academic integrity is intellectual honesty and responsibility for academic work that you submit individual or group work. It involves commitment to the values of honesty, trust, and responsibility. It is expected that students will respect these ethical values in all activities related to learning, teaching, research, and service. Therefore, plagiarism and other acts against academic integrity are serious academic offenses.

The responsibility of the institution

Instructors and academic units have the responsibility to ensure that standards of academic honesty are met. By doing so, the institution recognizes students for their hard work and assures them that other students do not have an unfair advantage through cheating on essays, exams, and projects.

The responsibility of the student

Plagiarism sometimes occurs due to a misunderstanding regarding the rules of academic integrity, but it is the responsibility of the student to know them. If you are unsure about the standards for citations or for referencing your sources, ask your instructor. Depending on the severity of the case, penalties include a warning, a failing

grade, a record on the students transcript, or a suspension.

It is your responsibility to understand the University's policy on academic integrity:
<http://web.uvic.ca/calendar2019-09/undergrad/info/regulations/academic-integrity.html>



How to Succeed in This Course

One effective way to learn is with a *Preview-Attend-Review-Practice-Assess* learning cycle. Some of that we build into the structure of the course, some is up to you.

Preview: Our classes are taught with a presumption that all students are engaging in pre-class work. That means watching the assigned video(s) or reading the sections of the text, and solving the pre-class problems. Come to class equipped with the foundations fresh in your head so we can build upon them. You can also think about what questions the preclass material brings up, and predict the outcomes of the class.

Attend: During class we are aiming for higher level learning objectives than the *preview* stage. Be engaged, ask questions, take notes that are actually useful for later, and collaborate with your peers when asked. And for everyone's sake, please show up on time.

Review: This stage is up to you. After class, review what you've learned so far. Do you have lingering questions? Can you summarize the big takeaways? Are there little details from class you need to still work out? Can you update your notes with new connections you are making?

Practice: Much like juggling, mathematics is best learned by actually *doing* mathematics. This takes a lot of practice and that is what both tutorials and the online homework are for. You can certainly do more practice than what is in tutorials and online homework, but at least do these. Try to work genuinely on your own or with others, but don't cut corners. Focus on making connections and understanding the concepts behind the calculations. It also never hurts to start early, so often we are ineffective at our practice because we start it late.

Assess: We give you big assessments like midterms, and smaller assessments like quizzes. You can and should learn from both of those, reviewing where you make mistakes and aiming to improve for the future. However, you can also assess on your own when there isn't a mark attached. How effectively are you learning this section? How well did the practice go? **Should you go get help, either at office hours, in the Coursespaces forum, or at the Math and Stats Assistance Centre?** How should you be changing your learning strategies?

Important administrative dates in Fall 2019

Last day for withdrawing from courses with 100% fee reduction: Tuesday, September 17.

Last day for adding courses: Friday, September 20.

Last day for withdrawing from courses with 50% fee reduction: Tuesday, October 8.

Last day for withdrawing from courses without penalty of failure: Thur, October 31.

Reading Break: Monday-Wednesday, November 11-13.

Last day of classes: Wednesday, December 4.

Examination period: Saturday December 7 - Saturday December 21.

All information in the course outline, including lecture schedule and topics are approximate and subject to change. All the announcements about the changes will be made in lectures. Students missing the announcements in class are responsible for the consequences.



Course Schedule

Week of	Topics	Important Dates
2/9/19	2.1: Rates of change and tangent lines 3.1 (Preview): Derivative at a point 2.2: Limit of a Function & Limit Laws	Wed 4/09 - first day of classes; <i>No tutorial this week; no MML Quiz</i>
9/9/19	2.2 (cont.): Limit of a Function & Limit Laws 2.4: One-sided Limits 2.5: Continuity	MML Quiz 1 (Thurs)
16/9/19	2.6: Limits at Infinity; Asymptotes 3.1: Derivative at a point 3.2: Derivative as a function 3.3: Differentiation rules	MML Quiz 2 (Thurs)
23/9/19	3.4: Derivative as a rate of change 3.5: Derivatives of trigonometric functions	MML Quiz 3 (Thurs)
30/9/19	3.6: Chain Rule 3.7: Implicit Differentiation 3.8: Derivs. of Inverse Functions & Logs	Midterm 1 in tutorial MML Quiz 4 (Thurs)
7/10/19	3.9: Inverse Trig Functions 3.10: Related Rates	MML Quiz 5 (Thurs)
14/10/19	4.1: Extreme values of functions 4.2: Mean Value Theorem 4.3: First derivative test	<i>No class or tutorial on Monday</i> MML Quiz 6 (Thurs)
21/10/19	4.4: Concavity and Curve sketching 4.5: L'Hopital Rule, Indeterminate forms	MML Quiz 7 (Thurs)
28/10/19	4.6: Optimization 3.11 Linearization and Differentials	Midterm 2 in tutorial MML Quiz 8 (Thurs)
4/11/19	4.7: Newton's method 4.8: Antiderivatives 5.1: Area	MML Quiz 9 (Thurs)
11/11/19	Reading Break 5.2: Sigma Notation & Limits of Finite Sums	<i>No classes or tutorial Mon-Wed</i> <i>No MML Quiz on Thurs</i>
18/11/19	5.3: Definite Integral 8.7: Numerical Integration	MML Quiz 10 (Thurs)
25/11/19	5.4: Fundamental Theorem of Calculus 5.5: Integration by Substitution 5.6: Area between curves	Midterm 3 in tutorial MML Quiz 11 (Thurs)
2/12/19	5.6 (cont.): Area between Curves Catch-up before Final exam	<i>No MML Quiz;</i> Wed 04/12 - last day of classes
Exam Period	7/12/19 – 21/12/19	Final exam date TBD