University of Manitoba
Faculty of Science
Department of Mathematics

<u>Sections</u>: This syllabus is for A sections only

A01:	MWF 10:30–11:20 am Location: 306 Tier	**A06:**	T 7:00–10:00 pm Location: 204 Armes
Instructor:	*I. Bilokopytov*	**Instructor:**	*C. Cowan*
A02:	MWF 9:30–10:20 am Location: 240 University College	**A07:**	TR 10:00–11:15 am Location: 231 Isbister
Instructor:	*N. Harland*	**Instructor:**	*F. Qi*
A03:	MWF 11:30 am–12:20 pm Location: 172 Robert Schultz	**A08:**	MWF 8:30–9:20 am Location: 240 University College
Instructor:	*G.I. Moghaddam*	**Instructor:**	*I. Ba*
A05:	TR 11:30am–12:45 pm Location: 221 Wallace		
Instructor:	*I. Bilokopytov*		

1   Section-specific information: See separate handout provided by your instructor.

2   Required material

Textbook: *Calculus: Early Transcendentals*, 8th Edition, by James Stewart.
You need <u>one</u> of the following textbook bundles, each of which includes access to the "Enhanced Web Assign" system, which is required to complete the online optional assignments (not for credit):

ISBN: 0176824480 (Hard copy bundle option):
Custom textbook for MATH 1500, Enhanced WebAssign Access Card for Calculus with Multi-Term Courses.

ISBN: 9781285858258 (Digital-only bundle option):
Enhanced WebAssign to Accompany Calculus, Multi-Term Courses.

If you plan to go on to later courses using Stewart (Math 1700 and 2720) see the bookstore shelves for further appropriate purchasing options.

The bookstore also sells a "Course Pack" of prior Math 1500 Midterm and Final Exams, with solutions, to help students prepare for exams. <u>This course pack is not required. It's up to you whether you purchase it!</u>

The department of math also provides an archive online here: `math.umanitoba.ca/courses/MATH1500` making old exams available to you at not cost—but these are without solutions and they are not recent.

3   Course Schedule & Outline

<u>Important Dates and Deadlines</u>

First day of classes:	Sept. 4	First day of labs:	Sept. 9
Last day to drop (w/ refund):	Sept. 17	Last day to add:	Sept. 18
Thanksgiving (no class):	Oct. 14	Remembrance Day (no class):	Nov. 11
Mid-Term Break (no class):	Nov. 12 – 15	Last day for voluntary withdrawal:	Nov. 18
Last day of classes:	Dec. 6	Final exam period:	Dec. 9–20

Topics to be covered, from Stewart's Calculus: Early Transcendentals, 8th Edition:

Section	Title	Suggested Homework
1.1	Four Ways to Represent a function	1-15, 22-64, 69-70
1.3	New Functions from Old Functions	1-4, 30-48, 59
1.4	Exponential Functions	1-6, 11-16, 19-20
2.2	Limit of a Function	1-12, 15-18, 31-41
2.3	Limit Laws	1-32, 37-46, 49
2.5	Continuity	1-8, 11-31, 41-43, 51-56
2.6	Limits at Infinity: Horizontal Asymptotes	1-10, 15-40, 47-52, 60-64
2.7	Derivatives & Rates of Change	5-8, 12-15, 17, 31-44
2.8	The Derivative as a Function	1-11, 16-18, 21-31, 37-40, 49-52
	Term Test 1: Oct. 7–11, 2019 in lab	
3.1	Derivatives of Polynomials & Exponential Functions	1-38, 49, 55-59, 64-67
3.2	Product & Quotient Rules	1-34, 41-48
3.3	Derivatives of Trigonometric Functions	1-24, 31-34, 39-52
3.4	The Chain Rule	1-54, 61-64, 77-79
3.5	Implicit Differentiation (omit inverse trig. functions)	1-32
3.9	Related Rates	1-35
1.5	Inverse Functions & Logarithms	1-18, 35-41, 49-58
3.6	Derivatives of Logarithmic Functions	1-34, 39-54
	Term Test 2: Oct. 31– Nov. 6, 2019 in lab	
4.1	Max & Min Values	1-44, 47-61
4.2	Mean Value Theorem	11-14, 21-33
4.3	How Derivatives Affect the Shape of a Graph	1-53
4.5	Curve Sketching (omit oblique asymptotes)	1-40, 42-52
	Term Test 3: Nov. 26–Dec. 2, 2019 in lab	
4.7	Optimization Problems	1-23, 25-41
4.9	Antiderivatives	1-18, 20-22, 25-43, 45-52, 59-65
5.4	Indefinite Integrals	1-35, 49-50
5.1	Areas and Distances	1-5
5.2	Definite Integral	1-3, 33-42, 51
5.3	Fundamental Theorem of Calculus	1-44, 53-58, 59-69

4   Evaluation and Grades

Item	Due Date(s)	Weight
Diagnostic test	See Section 6	5%
Quizzes	See section 5	10%
Term Tests (in lab)	Held in the following weeks: Oct. 7–11 Oct. 31 – Nov. 6 Nov. 26 – Dec. 2	12% each
Final exam	(2 hrs) Date and time TBA	49%

Letter Grade	Minimum percentage to guarantee	Final Grade Point
A+	91	4.5
A	83	4.0
B+	78	3.5
B	72	3.0
C+	66	2.5
C	60	2.0
D	51	1.0

Student must score of at least 40% on the final exam to obtain a letter grade higher than D.

All topics taught in the course, **including proofs**, are testable.

No calculational aids of any kind (calculator, smartphone, abacus) are permitted on the diagnostic test, worksheets, midterm nor final exam in this course.

Re-weighting of final grade or make-ups will not be considered for poor performance on any assessment.

5   Tutorials (labs)

You are required to attend a tutorial (sometimes called lab) section with this course that will be led by an experienced student mentor. Tutorials are 75 minutes long. During the first 45 minutes, students will work individually or in groups on worksheets that will challenge you on the course content and help prepare you for upcoming assessments such as mastery based quizzes and term tests.

Mastery based quizzes (MBQ)

During the final 30 minutes of the tutorials, you may have the opportunity to write up to 2 *mastery based quizzes* (MBQ). Each MBQ is approximately 15 minutes in duration. There are five MBQ's you are required to attempt, each focussing on a particular course topic, each made available as the course progresses. The topics are: limits, derivatives (conceptual understanding), related rates, derivatives (computational mastery), and curve sketching.

Moreover, each MBQ is available in two levels of difficulty—Level I and Level II. During most tutorials (see tentative schedule on UM Learn), you may write up to 2 available MBQs at any level—multiple attempts are allowed. There is no limit on the number of attempts; however, students may only write up to 2 MBQ's in their registerd tutorial. The grade recorded for each MBQ depends on the level you chose to write. A Level I MBQ contributes at most 1% towards your final grade, while a Level II MBQ contributes at most 2% towards your final grade. (For multiple attempts: the highest grade is recorded.) See the table below.

MBQ Level	Your score	Your grade
Level I	80% or higher	1
	below 80%	0
Level II	80% or higher	2
	below 80%	0

<u>Note</u>: You MUST write your MBQs in your registered tutorial.

6   <u>Diagnostic Test Instructions:</u>

<u>Step 1: The First Pre-Calculus Diagnostic Test</u>

- The first opportunity to write the diagnostic test will occur in your first tutorial. Tutorials begin **Monday 9 September.**

- If you obtain a grade of 70% or higher on the diagnostic test, then you earn the entire 5% of your diagnostic test grade and you are done. If you get less than 70% then go to step 2.

- If you do not write the diagnostic test during your first tutorial for any reason (for example you do not show up to the first tutorial or if you registered late for the course) then go to step 2.

<u>Step 2: Remediation</u>

- If your grade is less than 50% on the first diagnostic test or if you did not take the diagnostic test, you are required to complete the following modules on *LevelUp*: Exponents, Polynomials, Solving by Factoring, Rational Expressions, Functions, Logarithms and Trigonometry.

- If your grade is at least 50% but less than 70%, you are required to complete the following modules on *LevelUp*: Functions, Logarithms and Trigonometry. However, it is <u>strongly recommended</u> that you also complete the modules on the topics for which you did not answer the questions correctly on the diagnostic test.

- <u>Note</u>: a module will be considered 'complete' only after you view **all** videos, and attempt **all** questions on **all** exercises and quizzes in that module. To be eligible to re-write the diagnostic test (Step 3 below), you must complete the required remediation as outlined above. Failure to complete the required remediation results in an automatic grade of 0 for the diagnostic test.

For information on how to access *LevelUp*, visit the following website:

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https://www.math.umanitoba.ca/undergrad-info/level-up/

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LEVEL-UP REMEDIATION MUST BE COMPLETED BY SEPTEMBER 27, 2019. However it is strongly recommended that you complete the remediation as soon as possible. If you are repeating the course, you must re-do the remediation. Any work on Level-up completed before September 1, 2019 will not count. Upon completion of the required remediation, please go to step 3.

<u>Step 3: Re-write the Pre-Calculus Diagnostic Test</u>

- To be eligible to re-write the diagnostic test, you MUST complete the remediation outlined in Step 2. If you have not fully completed remediation, you will automatically receive a 0 for the diagnostic test (whether you write the second diagnostic test or not).

- The diagnostic test will be 50 minutes and there are many times available during the week of September 30 to October 4 in **107 Machray Hall**. But seating is limited! So please sign-up for the second diagnostic test early—you do NOT need to wait until your remediation is complete to sign-up. Deadline to sign-up: September 27.

- Sign-up instructions: on UM Learn, Select Communication → Groups, click View Available, click on the available time slot you want.

- If you get at least 70% on the second diagnostic test, you get the full 5 marks on your final grade. Otherwise you get your percentage score of the 5 marks. Students who do not write the second diagnostic test for any reason will receive a 0, unless appropriate supporting documentation is provided. Please contact your instructor with your supporting documentation to discuss further.

- If you missed your scheduled time or arrived late, you are permitted to write during another available time PROVIDED there is space for you to write. In this case, on UM Learn: go to Communication → Groups, select Leave Group and then View Available to select another available time (if there is one).

7   Optional WebAssign assignments

Optional Webassign Assignments for MATH 1500 are accessible through an electronic education solution called WebAssign System, using content from Nelson Education, Ltd. These are **optional (i.e. not for marks)** assignments intended to give you additional opportunities to practice and self-study.

In order to provide all MATH 1500 students with access to the digital content, the Department of Mathematics has provided Nelson Education Ltd with the student numbers of all MATH 1500 students for the purpose of authenticating users and providing access to their on-line content within the Enhanced WebAssign System.

To login to WebAssign: Go to www.webassign.net, and click "Log in".

Your username/email address is (student ID)`umanitoba.ca`

Your initial password is `Nelson(student ID)`

For example, if your student number is 6750443, then your username is `6750443@umanitoba.ca` and your initial password is `Nelson6750443`.

Do not include any zeroes at the front of your student ID. Please change your password once you log-in. **Immediately record your new password and keep it in a secure location. If you lose your password for any reason contact the lecturer for your section; it may take a while for access to be restored!**

After first logging in, you will have 14 days to enter the access code bundled with your textbook in order to use the system for the term. **Please note that if you just purchase the webassign from the bookstore in lieu of a textbook, the code you receive from the bookstore is not the webassign code. Please follow the instructions you receive from the bookstore.**

8   Attendance Policy

Attendance is mandatory at all classes and labs.

9 Term Tests:

The term tests will be held in the labs during the periods outlined in Section 4. Students who miss writing one term test for valid medical or compassionate reasons will have their final grade breakdown adjusted by re-weighting the final exam accordingly (i.e., increasing the weight of the final exam by 12%) Students who miss writing more than one term test should discuss their situation with their instructor.
Students who miss writing a term test must contact and notify their instructor no later than 48 hours after their scheduled test (but preferably earlier).

You are required to take the test in the tutorial for which you are registered. Taking the test in another time slot will result in a score of 0 and may be interpreted as an act of academic dishonesty.

10 Final examination:

The date, time, and location of a **2-hour-long** final examination will be set and published by the Registrar's Office. Students are reminded that they must remain available until all examination and test obligations have been fulfilled. The final exam period is 9–20 December, 2019.

11 Expectations

Learning mathematics is a lot like building a house. A strong foundation is needed to produce a sturdy structure, while a weak foundation will quickly expose any structural deficiencies. In much the same way, a good grounding in high school mathematics is required for your study of MATH 1500 to be successful.
You cannot learn mathematics by cramming at the end of term. It is not that kind of subject; it involves ideas and computational methods which cannot be learned without practice. By way of analogy, how many athletes do you know who do well in contests by training for only a few days in advance?

These notes attempt to provide some hints about how to get the most out of the teaching system used for this course (lectures, labs and assignments), and other useful sources (Help Centre, marks). You should be aware of the following regulations about lectures and labs.

1. You must **take and also attend** one of the labs for which you are registered. Consult the Registration Guide for the times of these labs.

2. Remember there are marks associated with your lab work: quizzes and tests must be written in the lab section in which you are registered.

Lectures: During lectures, professors present the course material to you. Because of the relatively large numbers of students in a lecture section and the necessity of presenting a certain amount of new material each day, lectures may seem rather formal. Almost certainly they will be quite different from your previous classroom experience.

No teaching system can be effective without work: Do not expect to learn mathematics simply by listening to lectures (or even taking notes). Here are a couple of ways to increase the effectiveness of the lecture system:

1. **Review** the lecture material as soon as possible, preferably the same day. Use the text during this review, and understand the material as completely as you can. Do as many textbook problems as you can; mathematics is a problem solving discipline. You cannot learn by watching other people solve problems—you have to solve them yourself.

2. **Refer to the course outline**, and try to read through the material before it is covered in lectures. When previewing like this it is not necessary to completely understand; familiarity with the general outline in advance of lectures will make them easier to follow.

Questions: Do not be troubled if you have questions, because everyone does. Some have less, some have more. In any case it is likely that if you have a question, others in class have the same question. Though you may have to take a deep breath to ask a question in class, this may also help your classmates.

Because of the relatively large number of students and the pace of the course, general discussion in lecture periods is limited. There will be more time available for questions in labs, but you may still find that you cannot get all your difficulties settled in lab time. Here are further ways to get answers.

1. **Study your textbook**. (This may seem pretty obvious, but people do not always think of it.)

2. **Talk the problem out with other students**. In this sort of exchange, both parties usually benefit. So, if someone asks you a question, do not brush them off as a waste your time. If you can solve their problem, you may well learn in the process. Even better, **form study groups** of 3-5 classmates with whom to study weekly.

3. **Go to your professor** during their office hours, or if that is not possible, email them to arrange another time or discuss your difficulty. You will find them quite willing to help.

4. **Go to the Mathematics Help Centre**, located in Room 412 Machray Hall, by yourself or collectively, with your study group. Its purpose is to provide a place where students can get answers to specific mathematical problems related to their course. You pay for this service via your course fees—so use it! The hours of operation will be posted on the door.

Do not expect anyone to re-teach large chunks of the course. It is **your responsibility** to keep up with course material.

12   Course Technology

It is University of Manitoba policy that all technology resources are to be used in a responsible, efficient, ethical and legal manner. The student can use all technology in classroom setting only for educational purposes approved by instructor and/or the University of Manitoba Student Accessibility Services. Do not participate in personal direct electronic messaging/posting activities (e-mail, texting, video or voice chat, wikis, blogs, social networking (e.g. Facebook)) online and offline "gaming" during scheduled class time. If you are on call (emergency) switch your cell phone to vibrate mode and leave the classroom to respond.
Your instructor will inform you if they plan a class webpage for your section besides UM Learn.

13   Recording Class Lectures

Your instructor and the University of Manitoba hold copyright over the course materials, presentations and lectures which form part of this course. No audio or video recording of lectures or presentations is allowed in any format, openly or surreptitiously, in whole or in part without permission. Course materials (both paper and digital) are for the participant's private study and research.

14   Student Accessibility Services

If you are a student with a disability, please contact SAS for academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g. mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.

Student Accessibility Services http://umanitoba.ca/student/saa/accessibility/
520 University Centre
204 474 7423
Student_accessibility@umanitoba.ca

15   Academic Integrity

The Department of Mathematics, the Faculty of Science and the University of Manitoba all regard acts of academic dishonesty in quizzes, tests, examinations or assignments as serious offences and may assess a variety of penalties depending on the nature of the offence.
Acts of academic dishonesty include bringing unauthorized materials into a test or exam, copying from another student, plagiarism and examination personation. Students are advised to read section 7 (Academic Integrity) and section 4.2.8 (Examinations: Personations) in the General Academic Regulations and Requirements of the current Undergraduate Calendar. **Note, in particular, that cell phones and pagers are explicitly listed as unauthorized materials, and hence may not be present during tests or examinations.**
Penalties for violation include being assigned a grade of zero on a test or assignment, being assigned a grade of "F" in a course, compulsory withdrawal from a course or program, suspension from a course/program/faculty or even expulsion from the University. For specific details about the nature of penalties that may be assessed upon conviction of an act of academic dishonesty, students are referred to University Policy 1202 (Student Discipline Bylaw) and to the Department of Mathematics policy concerning minimum penalties for acts of academic dishonesty.
All students are advised to familiarize themselves with the **Student Discipline Bylaw**, which is printed in its entirety in the Student Guide; also available on-line or through the Office of the University Secretary. Minimum penalties assessed by the Department of Mathematics for acts of academic dishonesty are available on the Department of Mathematics web-page.

16   Notice Regarding Collection, Use, and Disclosure of Personal Information by the University

Your personal information is being collected under the authority of The University of Manitoba Act. It will be used for the purposes of grading papers and providing feedback to students. Personal information will not be used or disclosed for other purposes, unless permitted by The Freedom of Information and Protection of Privacy Act (FIPPA). The University of Manitoba has taken steps to ensure that its agreements with Crowdmark, Inc. and WebAssign for services provided by the Crowdmark and WebAssign applications are in compliance with FIPPA. Please be aware that information held by Crowdmark Inc. and Webassign may be transmitted to and stored on servers outside of the University of Manitoba, or Canada. The University of Manitoba cannot and does not guarantee protection against the possible disclosure of your data including, without limitation, against possible secret disclosures of data to a foreign authority in accordance with the laws of another jurisdiction. If you have any questions about the collection of personal information, contact the Access and Privacy Office (tel. 204-474-9462), The University of Manitoba, 233 Elizabeth Dafoe Library, Winnipeg, Manitoba, Canada, R3T 2N2.

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