

Course Information and Syllabus for
Math 222 section 001 (Calculus 3)

McGill University
Fall 2005

October 12, 2005

0.1 Reaching me

1. **Instructor:** Payman L Kassaei
2. **Lecture Section:** 001
3. **Office:** Burnside 1219
4. **Office Hours:** TBA
5. **Telephone:** 398-3831
6. **E-Mail:** kassaei@math.mcgill.ca
7. **Classroom:** Burnside 1B36
8. **Class Hours:** MWF 9:35–10:25

0.2 Reaching you (VERY IMPORTANT)

0.2.1 Keep your e-mail address up to date

Both WebCT and **WeBWorK** (see ahead for a description) contain an e-mail address where we may assume you can be reached. If you prefer to use another e-mail address, the most convenient way is to *forward* your mail from your student mailbox, leaving the recorded addresses in these two systems unchanged. You can enter or change a forwarding e-mail address by going to <http://webmail.mcgill.ca>, and logging in to your student mailbox at po-box.mcgill.ca.

0.2.2 Check the course website and Announcements

These notes, and other materials distributed to students in this course, will be accessible (and revised) at the following URL:

<http://www.math.mcgill.ca/~kassaei/teaching/222.html>

IMPORTANT Check the *Announcement Section* of the above webpage frequently. All important information will be posted there.

WeBWorK will also be available via a link from the WebCT URL:

<http://webct.mcgill.ca>

but other features of WebCT have not yet been implemented.

0.3 Calendar Description

MATH 222 CALCULUS 3. (3 credits. 3 hours lecture. Prerequisite: MATH 141. Familiarity with vector geometry or Corequisite: MATH 133. Restriction: Not open to students who have taken CEGEP course 201-303 or MATH 150. MATH 151, or MATH 227) Taylor series, Taylor's Theorem in one and several variables. Review of vector geometry. Partial differentiation, directional derivative. Extrema¹ of functions of 2 or 3 variables. Parametric curves and arc length. Polar and spherical coordinates. Multiple integrals.

0.4 Tutorials; Tutor's Coordinates

The tutor for the course is Mr. Andrew Archibald. His office is BURN 1034. His weekly office hours will be (TO BE DETERMINED). The optional tutorials will be on Tuesdays, from 13:35 to 14:25, at a location to be announced. (While registration for the tutorial is not required, your registration will help us better manage the tutorial, including possibly advising students if there should be a problem with a particular session.)

0.5 Evaluation of Your Progress

0.5.1 Your final grade

(See Table 1, p. 6) Your grade in this course will be a *letter grade*, based on a percentage grade computed from the following components:

1. Ten **WeBWorK** homework assignments (cf. §0.5.3) — counting together for 15%. All **WeBWorK** assignments must be completed by their posted expiration dates and times. The Assignments will be numbered W_1, \dots, W_{10} .²
2. A Class Test, tentatively scheduled for Monday, October 31st, 2005, at the regular class time. The Class Test will count for either 15% or 0% of your final grade, whichever is to your advantage.
3. The final examination — counting for either 70% or 85% of the final grade.

Where a student's performance on the final examination is superior to her performance on the Class Test, the final examination grade will replace *the test grade* in the calculations. *It is not planned to permit the examination grade to replace the grades on **WeBWorK** assignments.*

¹The calendar description misspells this word.

²Assignment W_0 is intended to introduce you to the **WeBWorK** system; it does not count.

0.5.2 WeBWorK

We use the **WeBWorK** system, developed at the University of Rochester — which is designed to expose you to a large number of drill problems, and where plagiarism is discouraged. **WeBWorK** *is accessible only over the Web*. **WeBWorK** assignments carry a due date and time; only answers submitted by this date and time will count. Some of the assignments have limits to the numbers of times a student may attempt a problem.

0.5.3 WeBWorK Assignments

There will be ten **WeBWorK** assignments, accessible at the URL

<http://msr05.math.mcgill.ca/webwork/m222f05>

Your user name will be your 9-digit student number, and your first password will be this same 9-digit student number. The 10 assignments will be paired — each even numbered assignment ($W_2, W_4, W_6, W_8, W_{10}$) will contain the same types of problems as on the preceding odd numbered assignment (W_1, W_3, W_5, W_7, W_9). You will have an unlimited number of tries on the problems on the odd numbered assignments; but there will be restricted numbers of tries on the even numbered assignments. The intention is that you should use each odd numbered assignment to thoroughly learn how to solve the problems, and then attempt the following even numbered assignment. The data on the even numbered assignment will probably be different — different numbers and/or functions, but the same concepts. It is expected that the due date for Regular assignments will be on specified Fridays, at midnight. If you leave your **WeBWorK** assignment until the hours close to the due time on the due date, you should not be surprised if the system is slow to respond. This is not a malfunction, but is simply a reflection of the fact that other students have also been procrastinating! To benefit from the speed that the system can deliver under normal conditions, do not delay your **WeBWorK** until the last possible day! If a systems failure interferes with the due date of an assignment, arrangements may be made to change that date, and an e-mail message may be broadcast to all users (to the e-mail addresses on record), or a note posted in the course announcements on WebCT; but slowness in the system just before the due time will not normally be considered a systems failure.³

BONUS assignment It is hoped that there will be one additional **WeBWorK** assignment, which will be *optional*. The grade on this assignment would replace the grade

³Should you find that the system is responding slowly, *do not* submit your solutions more than once; you may deplete the number of attempts that have been allowed to you for a problem: this will not be considered a systems failure.

on any other **WeBWorK** assignment with a lower grade, or replace a missed assignment. This assignment will have limits on the numbers of attempts. Further details will be announced in the lectures or on the WebCT or **WeBWorK** sites.

0.5.4 Final Examination

A 3-hour-long final examination will be scheduled during the regular examination period for the fall term (December 5th, 2005 through December 20th, 2005). You are advised not to make any travel arrangements that would prevent you from being present on campus at any time during this period.

0.5.5 Calculators

The use of calculators is not permitted in either the Class Test or the examination in this course. Students whose previous mathematics courses have been calculator-oriented would be advised to make particular efforts to avoid the use of a calculator in solving problems in this course, in order to develop a minimal facility in manual calculation. This means that *you are urged to do all arithmetic by hand.*

0.5.6 Supplemental Assessments

Supplemental Examination. There will be a supplemental examination in this course. (For information about Supplemental Examinations, see

<http://www.mcgill.ca/artscisao/departmental/examination/supplemental/>.

Note, in particular, that a Supplemental Examination may be written only by a student who has obtained a grade of F or D as a grade in the course, and that the grade on the Supplemental Examination *counts in your average as though you have taken the course again — without a term work component!*)

There is No Additional Work Option. “Will students with marks of D, F, or J have the option of doing additional work to upgrade their mark?” No. (“Additional Work” refers to an option available in certain Arts and Science courses, but not available here.)

0.5.7 Machine Scoring

The final examination will not be machine scored.

0.5.8 Plagiarism

While students are not discouraged from discussing methods for solving **WeBWorK** assignment problems with their colleagues, all the work that you submit — whether through **WeBWorK** or written assignments, or the final examination must be your own. The Senate of the University requires the following message in all course outlines:

“McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures. (See <http://www.mcgill.ca/integrity> for more information).

“L’université McGill attache une haute importance à l’honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l’on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l’étudiant et des procédures disciplinaires. (Pour de plus amples renseignements, veuillez consulter le site <http://www.mcgill.ca/integrity>.)”

It is a violation of University regulations to permit others to solve your WeBWorK problems, or to extend such assistance to others; you could be asked to sign a statement attesting to the originality of your work. The Handbook on Student Rights and Responsibilities⁴ states in ¶A.I.15(a) that

“No student shall, with intent to deceive, represent the work of another person as his or her own in any academic writing, essay, thesis, research report, project or assignment submitted in a course or program of study or represent as his or her own an entire essay or work of another, whether the material so represented constitutes a part or the entirety of the work submitted.”

You are also referred to the following URL:

<http://www.mcgill.ca/integrity/studentguide/>

⁴<http://upload.mcgill.ca/secretariat/greenbookenglish.pdf>

Item	#	Due Date	Details
WeBWorK Assignments (cf. §0.5.3) <div style="border: 1px solid black; display: inline-block; padding: 2px;">15%</div>	W_0		DOES NOT COUNT: introduces WeBWorK
	W_1	24 Sept 05	No limits on number of attempts
	W_2	30 Sept 05	Same scope as W_1 , but with limited numbers of attempts
	W_3	07 Oct 05	No limits on number of attempts
	W_4	15 Oct 05	Same scope as W_3 , but with limited numbers of attempts
	⋮		
	W_9	18 Nov 05	No limits on number of attempts
	W_{10}	25 Nov 05	Same scope as W_9 , but with limited numbers of attempts
	BONUS(???)	02 Dec 05	see page 3, limited numbers of attempts
	Class Test	T	31 Oct 05
<div style="border: 1px solid black; display: inline-block; padding: 2px;">15% or 0%</div>	⋮		
Final Exam		05–20 Dec 05	Date of exam to be announced by Faculty
<div style="border: 1px solid black; display: inline-block; padding: 2px;">70% or 85%</div>			
Supplemental Exam		01–02 May 06	Date of exam to be announced by Faculty; only for students who do not obtain standing at the final. Supplemental exams count in your average like taking the course <i>again</i> ; exam counts for 100%.

Table 1: Summary of Course Requirements, as of October 12, 2005 (all dates are subject to change)

0.6 Textbooks

0.6.1 Required Textbook

The textbook for the course is *either*

Calculus of Several Variables, 5th Edition, by Robert A. Adams, (Pearson Education Canada, 2002); Cloth, 640 pp; ISBN: 0-201-79802-6

*or*⁵

Calculus: A Complete Course, 5th Edition, by Robert A. Adams, (Pearson Education Canada, 2002); Cloth, 1280 pp; ISBN: 0-201-79131-5

⁵The first book listed is the second half of the second listed.

0.6.2 Optional Reference Books

It is strongly recommended that students make use of the student solution manual:

Student's Solutions Manual, 5th edition, by Robert A. Adams, (Pearson Education Canada, 2003); Paperbound, 160 pp. ISBN: 0-201-79801-8.

0.6.3 Textbook/Reference Bundle

It is possible that the textbook and reference book will be available at the bookstore in a “bundle”, costing less than the two books purchased separately. The information I have available at this time is that the bundle is Calculus of Several Variables, with Solution Manual, Fifth Edition by R. A. Adams. Addison, Wesley, Longman, Toronto (2003). ISBN 0-131-30566-2.

0.6.4 Other Calculus Textbooks

While students may wish to consult other textbooks, or other editions of the recommended textbook, I will normally refer only to the prescribed edition of the prescribed textbook for the course. Other books can be very useful, but the onus is on you to ensure that your book covers the syllabus to at least the required depth; where there are differences of terminology, you are expected to be familiar with the terminology of the textbook.

0.7 Syllabus

In the following list section numbers refer to the text-book [1], [2]. The syllabus will include most of Chapters 9–14, with omissions as listed below.⁶

0.7.1 Omitted sections of textbook Chapters 9-14 (subject to change)

§9.10 Series Solutions of Differential Equations

§10.7 Using Maple for Vector and Matrix Calculations

⁶If a textbook section is listed below, you should assume that all material in that section is examination material *even if the not every topic has been discussed in the lectures*; however, I may give you information during the term concerning topics that may be considered subsidiary.

Do not assume that a topic is omitted from the syllabus if it has not been tested in a WeBWorK assignment or the Class Test, or if it has not appeared on any of the old examinations in the course! Some topics do not lend themselves to these types of testing; others may have been omitted simply because of lack of space, or oversight. By the same token, you need not expect every topic in the course to be examined on the final examination.

§11.2 Some Applications of Vector Differentiation

§11.5 Curvature and Torsion for General Parametrizations

§11.6 Kepler's Laws of Planetary Motion

§12.9 Taylor Series and Approximations

§13.4 The Method of Least Squares

§13.5 Parametric Problems

§13.6 Newton's Method

§13.7 Calculations with Maple

§14.6 Change of Variables in Triple Integrals

§14.7 Applications of Multiple Integrals (part)

(In addition to the omitted sections, there will also be omissions of certain subsections of sections that are otherwise included. Specific information will be given as the sections are discussed.)

A Timetable for Lecture Section 002 of MATH 222 2005 09

Distribution Date: (0th version) Friday, September 2nd, 2005
(All information is subject to change.)

MONDAY	WEDNESDAY	FRIDAY
SEPTEMBER		
		01 §§9.1, 9.2
05 LABOUR DAY	07 §§9.2, 9.3	09 §§9.3, 9.4
Course changes must be completed by midnight, September 13, 2005		
12 §§9.4, 9.5	14 §9.5	16 §9.6
Deadline for withdrawal from course with fee refund = September 18, 2005		
19 §9.7, supplemented by §4.8	21 §9.8	23 §9.9, X W_1
26 §§10.1–10.6	28 §§10.2–10.6	30 §11.1 W_2
OCTOBER		
03 §11.3	05	07 §11.4 W_3
Deadline for withdrawal (with W) from course = Oct. 09, 2005		
10 THANKSGIVING DAY (Canada)	13 §11.5	15 §§12.1,12.2 W_4
17 §12.3(part), §12.4(part)	19 §12.5	21 §12.6 W_5
24 §12.7	26 §12.8	28 §12.9 W_6
31 <i>CLASS TEST</i>		

Notation:

- W_n = **WeBWorK** Assignment W_n due at midnight on Friday this week
(Assignment W_0 introduces **WeBWorK**, and does not count in your grade.)
- Ⓜ = Read Only
- X = reserved for eXpansion or review
- Section numbers refer to the text-book.

MONDAY		WEDNESDAY		FRIDAY	
NOVEMBER					
		02	§13.1	04	§13.2(part) W_7
07	§13.3	09	X	11	§14.1 W_8
14	§14.2	16	§14.2, §14.3	18	§14.4 W_9
21	§14.4	23	§14.5	25	§14.7(part) W_{10}
28	X	30	X		
DECEMBER					
				2	X $W_{BONUS?}$

Notation:

- W_n = **WeBWorK** Assignment W_n due at midnight on Friday this week
 (Assignment W_0 introduces **WeBWorK**, and does not count in your grade.)
- Ⓜ = Read Only
- X = reserved for eXpansion or review
- Section numbers refer to the text-book.

B References

- [1] R. A. Adams, *Calculus of Several Variables, Fifth Edition*. Addison, Wesley, Longman, Toronto (2003). ISBN 0-201-79802-6.
- [2] R. A. Adams, *Calculus: A Complete Course, Fifth Edition*. Addison, Wesley, Longman, Toronto (2003). ISBN 0-201-79131-5.