DAWSON
COLLEGE

Mathematics Department
Calculus II (SCIENCE)
201-NYB-05 Section 1
FALL 2011

Instructor: Yann Lamontagne
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Office Hours: Office hours are posted beside the door of office 7B.7 and on the website.
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The solutions to the quizzes and tests as well as additional examples are posted on the website. The material of previously taught courses is also available on the website.

Term Work: *(possibly worth 50% of final grade, see Grading Policy)*:

3 Class Tests*	worth a total of 40%	on:
	Test 1	**Tuesday October 4th in room 4C.1**
	Test 2	**Tuesday November 8th in room 4C.1**
	Test 3	**Tuesday December 6th in room 4C.1**
Quizzes**	worth a total of 10%	on:
		every Tuesday except on test days

* Each class test is an hour and half in duration.
** Each class quiz is 15 minutes in duration. The contents of the quiz is mostly taken from the assigned excercises of previous lectures.

Important:

- There will be no make-up tests or quizzes. If a valid medical note is presented the weight of the quiz or test will be transferred to the weight of the final examination.
- Students who will be absent for any predictable reason on a quiz/test day must inform their teacher in writing within the first two weeks of the semester of their intent to be absent so that alternative arrangements can be made at the earliest opportunity. The written notice must be given even when the exact date is not known until later.
- Please note that I do **not** use Omnivox MIO, and messages sent to MIO are unfortunately ignored.

DAWSON
C O L L E G E

Mathematics Department
Calculus II (SCIENCE)
201-NYB-05

Ponderation: 3-2-3

Prerequisite: Calculus I *(201-NYA/201-NYA-05)* preferably the Science version.

Objectives: This course introduces the student to Integral Calculus, to the techniques of integration and to some of the applications of integration to physical problems. Another look at limits and an introduction to the topic of infinite series are included. Use of mathematical software will be explored. For more details, see pages 44 to 49 of the Dawson Science Program.

Text: *Single Variable Essential Calculus - Early Transcendentals* by James Stewart.

References: *Calculus of a Single Variable* by R. Larson, R. P. Hostetler, B. H. Edwards
Or any standard text book on Calculus of a Single Variable.

Methodology: Lectures and problem solving sessions.

Termwork: The term grade is based on a minimum of $4\frac{1}{2}$ hours of tests/quizzes.

Final Examination: The Final Examination will be a supervised, comprehensive examination held during the formal examination period. There are no exemptions.

Grading Policy: The final grade shall consist of the greater of:
(A) Termwork for 50% and Final Examination for 50% of final grade
(B) Final Examination for 100% of final grade.
To qualify for (B) the student must have obtained at least 50% of the termwork mark and must have witten more than 50% of the class tests.

Standard of Performance: In order to pass this course the student must obtain a final grade of at least 60%.

Calculators: A calculator without text storage or graphing capabilities is allowed for the Final Examination.

Formula Sheets: No formula sheet will be permitted for quizzes, class tests and the Final Examination.

Department Website: For final examinations from previous years and other useful information consult the departmental website:
Go to `http://www.dawsoncollege.qc.ca`
→ go to PROGRAMS
→ go to DISCIPLINES
→ go to MATHEMATICS

Math Tutorial Room: Volunteer math teachers are available for help in room 7B.1. The schedule of available teachers is available on the door of the tutorial room and the department website.

Literacy Policy: Problem solving is an essential component of this course. Students will be expected to analyze problems stated in words, to present their solutions logically and coherently, and to display their answers in a form corresponding to the statement of the problem, including appropriate units of measurement. Marks will be deducted for work which is inadequate in their respects, even though the answers may be numerically correct.

Policy on Cheating and Plagiarism:

Cheating in Examinations, Tests, and Quizzes:

Cheating includes any dishonest or deceptive practice relative to formal final examinations, in-class tests, or quizzes. Such cheating is discoverable during or after the exercise in the evaluation process by the instructor. Such cheating includes, but is not limited to

a. copying or attempting to copy another's work.
b. obtaining or attempting to obtain unauthorized assistance of any kind.
c. providing or attempting to provide unauthorized assistance of any kind.
d. using or possessing any unauthorized material or instruments which can be used as information storage and retrieval devices.
e. taking an examination, test, or quiz for someone else.
f. having someone take an examination, test, or quiz in one's place.

Unauthorized Communication:

Unauthorized communication of any kind during an examination, test, or quiz is forbidden and subject to the same penalties as cheating.

Plagiarism on Assignments and the Comprehensive Assessment:

Plagiarism is the presentation or submission by a student of another person's assignments or Comprehensive Assessment as his or her own. Students who permit their work to be copied are considered to be as guilty as the plagiarizer.

Obligation of the Teacher:

Every instance of cheating or plagiarism leading to a resolution that impacts on a student's grade must be reported by the teacher, with explanation, in writing to the Chair of Mathematics and to the Dean of Pre-University Studies. A copy of this report must also be given to the student.

Penalties:

Cheating and plagiarism are considered extremely serious academic offences. Action in response to an incident of cheating and plagiarism is within the authority of the teacher. Penalties may range from zero on a test, to failure of the course, to suspension or expulsion from the college.

Students' Obligations:

a. Students have an obligation to remain informed about what takes place in their regularly scheduled classes. Absence from class does not excuse students from this responsibility.
b. Students have an obligation to arrive on time and remain for the duration of scheduled classes and activities.
c. Students have an obligation to write tests and final examinations at the times scheduled by the teacher or the College. Students have an obligation to inform themselves of, and respect, College examination procedures.
d. Students have an obligation to show respectful behavior and appropriate classroom deportment. Should a student be disruptive and/or disrespectful, the teacher has the right to exclude the disruptive student from learning activities (classes) and may refer the case to the Director of Student Services under the Student Code of Conduct.
e. Cellular phones, pagers and musical listening devices have the effect of disturbing the teacher and other students. All these devices should be turned off. Students who do not observe these rules will be asked to leave the classroom.
f. Cell phones must also be put away. Text messaging is not allowed in class.

Religious Holidays:

Students who wish to observe religious holidays must inform each of their teachers in writing within the first two weeks of each semester of their intent to observe the holiday so that alternative arrangements convenient to both the student and the teacher can be made at the earliest opportunity. The written notice must be given even when the exact date of the holiday is not known until later. Students who make such arrangements will not be required to attend classes or take examinations on the designated days, nor be penalized for their absence. It must be emphasized, however, that this College policy should not be interpreted to mean that a student can receive credit for work not performed. It is the student's responsibility to fulfill the requirements of the alternative arrangement.

Course Content:

Specific Competencies	Learning Activities	Sections and Problems
Antiderivatives *(review)* Reimann Sums The Fundamental Theorem of Calculus	• Area under a simple curve using Reimann Sum. • Definite integral as the limit of a Riemann Sum. • Proof of the Fundamental Theorem of Calculus. • Substitution Rule • Average Value of a Function • Mean Value Theorem for Integrals	§4.7: Antiderivatives, p246 1-30, 33-41, 44 *review* Review, p250 49-56 §5.1: Areas and Distances, p260 1, 3, 5, 11-14 §5.2: The Definite Integral, p273 1,3,5, 11-26, 29-42, 46,47,49,51 §5.3: Evaluating Definite Integrals, p282 1-30, 35-38, 41-46, 63 §5.4: The Fundamental Theorem of Calculus, p291 1-20, 23*-25*, 27*, 31* §5.5: The Substitution Rule, p299 1-54, 61*-65* *review of indefinite integrals* Review, p302 7-29, 31-32, 35-39, 42, 46, 51*-54* True-False Quiz*, p300 1-13
Techniques of Integration	• Integration by parts • Trigonometric integral using identities • Trigonometric Substitutions • Partial Fractions	§6.1: Integration by Parts, p304 1-31, 42*-44* §6.2: Trigonometric Integrals and Substitutions, p319 1-62 §6.3: Partial Fractions, p327 1-42, 44*, 46* Review, p355 1-40 True-False Quiz*, p354 1-7, 9-14
Numerical Integration *(optional)*	• Approximate certain integrals using Simpson's Rule	§6.5: Approximate Integration p343 7-16 Review, p356 57, 58
Indeterminate Forms and L'Hôpital's Rule *(review)*	• Evaluate Limits of Indeterminate Forms using L'Hôpital's Rule	§3.7:Indeterminate Forms and l'Hospital's Rule, p193 1-36, 47*-50* Review, p197 67-82
Improper Integrals	• Determine the convergence of improper integrals	§6.6: Improper Integrals p352, 1-2, 5-32, 47, 48*, 49*, 52*, 61*, 62* Review, p355 41-50
Applications of Integration	Extend the notion of the Definite Integral to calculate: • The area bounded between two curves • The volume of a solid of revolution: disk, washer, shell methods • Arc length • Applications to Physics and Engineering *(optional)*	§7.1: Areas between Curves, p361 1-16, 21, 29*, 31*-37* §7.2: Volumes, p370 1-16, 21, 22, 25 §7.3: Volumes by Cylindrical Shells, p376 1-26, 33-39, 41 §7.4: Arc Length, p383 1-10, 12-14 §7.5: Applications to Physics and Engineering, p394 Review, p408 1-14, 25-26
Infinite Sequence	• Convergence or divergence of infinite sequences	§8.1: Sequences, 1-28, 33-36, 46*
Infinite Series	• Sum of an infinite series from the definition. • Geometric and Telescoping series; applications • Tests for convergence of series: – Integral test – Comparison and limit comparison test – Ratio and root test – Alternating series test • Absolute and conditional convergence • Interval of convergence of a power series	§8.2: Series, p427 1-32, 35*, 39* §8.3: The Integral and Comparison Tests, p436 3-4, 6-26, 27* §8.4: Other Convergence Tests, p446 19-39, 40*, 42a* §8.5: Power Series, p451 3-21 Review, p480 1-29 True-False Quiz*, p479 1-12, 14-18
Taylor and Maclaurin Series	• Finding the Maclaurin and Taylor series using their definition.	§8.7: Taylor and Maclaurin Series, p469 1-8, 11-18 Review, p480 43-50

* Indicates enriched or theoretical questions