Collège Édouard-Montpetit

201-2A5-EM
WINTER 2012

MATHEMATICS

Course Outline

COURSE : Mathematics for Aircraft Maintenance

PROGRAM : 280.C0 Mathematics

DISCIPLINE : 201 - Mathematics

Pondération :	Theory : 3	Practice : 2	Personal Study : 3

INSTRUCTOR	OFFICE	☏ extension	✉ courriel ou site web
Alexandre Laurin	C-184	4651	Alexandreg.laurin@college-em.qc.ca

OFFICE HOURS *TBA*

	LUNDI	MARDI	MERCREDI	JEUDI	VENDREDI
Avant-midi					
Après-midi					

COORDINNATOR	OFFICE	☏ extension	✉ courriel
Claire St-Jacques	C-184	4549	Claire.st-jacques@college-em.qc.ca

CONTEXT OF COURSE IN THE STUDENT'S PROGRAM

This course is the second and last mathematics course for students in the Aircraft Maintenance Program (280.C). Whereas the preceding course (Math 201-115-EM), which was part of all three ÉNA programs, reviewed and reinforced important concepts of algebra, trigonometry, geometry and vector geometry, the core of this course is to introduce students to differential calculus.

After studying arithmetic in primary school and algebra in secondary school, college students who study differential and integral calculus have entered the world of adults, from a mathematical point of view.

OBJECTIVE

To model and interpret mathematical results for aerospatial applications

TEACHING AND LEARNING STRATEGIES

During each period of this course, formal lecture presentations will alternate with practice time so that you can work on exercises suggested by the teacher. The formal lectures are designed to introduce theoretical concepts and the examples allow students to understand these concepts. Occasionally, possibilities available on the internet or specialized mathematical software programs such as Wiris and Excel may be demonstrated. Frequently the course will begin with a period of warm-up exercises that review material seen in the preceding course. The two-hour course is delivered without a break (2 x 50 minutes without interruption.)

The personal work done outside of class is intended to help you complete the exercises suggested by the instructor during the practice periods and to encourage you to review and study the subjects covered during the theory presentations. Success in this course depends mainly on your individual work. You should not hesitate to take advantage of the instructor's office hours. If you must be absent from a course, you are expected to find out from other students in the course what was done or said during your absence and make up missed work as quickly as possible. If necessary, you should contact the instructor.

You must regularly consult the college's website LEA (Omnivox). LEA can be used as a message board for communication between students and teacher; the teacher will also use it to post documents related to the course.

TRICKS AND TIPS

- Keep the partying for the weekend, come to class fresh and healthy.
- Come to every single class. There is no substitute for this.
- Do the homework. 9 times out of 10, a student that fails did not do the homework.
- If you do not understand something, go see the teacher. This is also a good way to show him/her that you are indeed working and the best way of sucking up to him/her. :

COURSE PLAN

Classes 1 to 4

Learning Objective	Content	Evaluation
1. To acquire basic concepts of exponential and logarithmic functions.	Properties of exponential functions and logarithms Solving exponential and logarithmic equations Applying exponential and logarithmic models Logarithmic scales.	Exam 1* written during Class 7 15 %

Classes 5 to 6

Learning Objective	Content	Evaluation
2. To model using Excel of scatter diagrams of points obtained experimentally	Linear, quadratic, exponential, logarithmic, and conic models Method of least squares Regression Interpolation et extrapolation	Homework 1: due for Class 6 5%

Classes 7 to 14

Learning Objective	Content	Evaluation
3. To acquire an intuitive concept of limits	Variation, rate of change, slope of a secant line Intuitive concept of infinitely small variations Intuitive concept of limit Simple calculation of limits by successive approximations Use of the limit concept in approximate calculations of the slopes of tangents, of surfaces, of volumes, etc. Applying these methods to concrete physical models: speed, acceleration, distance, consumption, power, output,energy input	Exam 2: written during Class 14 20%
4. To acquire and apply an intuitive concept of derivatives	Instantaneous rate of change Intuitive concept of derivatives at one point Calculate and evaluate the derivative of simple functions	

Classes 15 to 24

Learning Objective	Content	Evaluation
4. To acquire and apply an intuitive concept of derivatives	Optimization. Use the concept of derivatives in modeling concrete situations: maximum, minimum, growth, decrease, study of behavior graphed on a curve, optimization, related rates	Exam 3: written during Class 22 20%
5. To solve algebraic, transcendental and trigonometric equations using derivatives.	Related Rates Problems. Finding an exact solution Finding an approximate solution (using a calculator efficiently, error calculation)	
6. To graph functions using derivatives.	Finding all critical points of a function and its derivative and graphing them in a cartesian plane.	

Classes 25 to 35

Learning Objective	Content	Évaluation
7. To acquire and apply the basic concept of integrals	Intuitive concept of the primitive and the integral Calculation and evaluation of integrals of simple functions Use of integrals in modeling concrete situations (speed, surface calculations, problems involving rate of change, etc.)	Final Exam 20%*
8. To use numeric series for approximate calculations of variables and functions.	Becoming familiar with the notation Special examples of series Calculating infinite sums Approximate calculation by series expansion (Maclaurin)	

Review: the remaining periods will be devoted to preparing for the comprehensive final exam

Comprehensive Final Exam: 30% (during the period of common exams at the end of the session)

REQUIREMENTS TO PASS THE COURSE

(1) Passing Mark

The passing mark for this course is 60%. There are no make-up exams

(2) Attendance for Summative Evaluations

Students who are absent for periodic exams due to serious circumstances (illness, death in the family, major event that prevented student from attending, etc.) must explain the absence and provide supporting documents within five work days following the exam. **If the instructor recognizes that the reasons are serious,** arrangements for a postponed exam will be made between the teacher and the student; otherwise, the student will receive a mark of zero (0) for this exam.

(3) Submitting Assignments

Assigned work must be submitted by the date, the location and the time determined by the instructor. Late assignments will be penalized 10% per day that they are late.

(4) Presentation of Written Work

Students must follow the standards adopted by the College for written work (« *Normes de présentation matérielle des travaux écrits* »). These can be found in the documentation centre on the College web site (http://ww2.college-em.qc.ca/biblio/normes.pdf) under the heading **"Aides à la recherché".**

REQUIRED MATERIAL

Six-Chapter Custom Version of ''Single Variable Calculus, Early Transcendentals,'' 6th edition, James Stewart Thomson, Nelson 2008

Coop Document on Excel

Students must have a recent model scientific calculator with statistical functions that has at least five memories. Graphic calculators are not permitted during exams.

MARK REVISIONS

Students should refer to the Institutional Policy for Evaluating Learning (PIÉA) for information regarding arrangements concerning mark revisions. This can be found in the student date book (agenda) or on the college web site. The committee for mark revisions is made up of three teachers: the teacher giving the course and two teachers giving or who have already given the same course.

The Committee for Mark Revisions for this course is:

• Danielle Bertrand, Mathematics teacher
• Pierre Letarte, Mathematics teacher
• Claire St-Jacques, Mathematics teacher.