Ponderation: 3-2-3

Prerequisite: Applied Mathematics *(201-943-DW)*

Objectives: This course consists of an introduction to single-variable calculus. Topics covered include limits and continuity, the derivative and differentiation, applications of the derivative to curve sketching, maximum/minimum and related rates problems, anti-differentiation, and the indefinite integral.
Specific to the Electronics Engineering Technology Program are the topics: the definite integral, areas by integration as well as applications of differentiation and integration to electronics.

Text: *Basic Technical Mathematics with Calculus - SI Version (9th Ed.)*
by Allyn J. Washington

References: Any standard textbook covering single variable calculus.

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 will be exemptions.

Grading Policy: The final grade shall consist of:
Termwork for 50% of final grade and Final Examination for 50% of final grade

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 math 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 these 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 comportment. 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 by Chapter

Chapter 23 (The Derivative):

Textbook Section	Topic	Relevent Exercises
§23.1 Limits	• Limits • Continuity	p.656 25-48, 56-64 p.656 5-24
§23.2 The Slope of a Tangent to a Curve	• Slope of a tangent line at a specific point • Slope of a tangent line at a general Point	p.660 7-10 p.660 11-22
§23.3 The Derivative	• Definition of the derivative	p.664 3-40
§23.4 The Derivative as an Instantaneous Rate of Change	• Applications to velocity/acceleration • Applications to electronics	p.668 11-24, 27, 28 p.668 29, 33
§23.5 Derivatives of Polynomials	• Derivatives of polynomials • Applications to velocity/acceleration • Applications to electronics	p.672 5-28, 37-41, 43, 49 p.672 29-36, 44 p.672 47
§23.6 Derivatives of Products and Quotients	• Derivatives of products and quotients (polynomial) • Applications to velocity/acceleration • Applications to electronics	p.676 3-32, 35, 39-43 p.676 49 p.676 45, 47, 52, 55
§23.7 Derivative of a Power of a Function	• Derivatives of powers (polynomial) • Applications to velocity/acceleration • Applications to electronics	p.682 5-36, 41-45 p.682 47, 49 p.682 52, 57, 58
§23.8 Differentiation of Implicit Functions	• Implicit differentiation (polynomial) • Applications to electronics	p.686 3-38 p.686 39, 45
§23.9 Higher Derivatives	• Higher order derivatives of polynomials • Applications to velocity/acceleration • Applications to electronics	p.689 3-36, 41-44 p.689 37-40, 47, 48 p.689 46, 49
Chapter 23 Review	• Limits • Definition of derivative • Derivatives (polynomials) • Implicit differentiation (polynomial) • Applications to velocity/acceleration • Applications to electronics	p.691 1-12, 45, 51 p.691 13-20 p.691 21-34, 37-44, 46-48, 53-56 p.691 35, 36 p.691 59, 60, 62, 64, 66 p.691 65, 67, 71, 75

Chapter 24 (Applications of the Derivative):

Textbook Section	Topic	Relevent Exercises
§24.1 Tangents and Normals	• Tangent and normal lines • Tangent and normal lines involving implicit differentiation • Applications to electronics	p.696 3-5, 7-9, 11-17, 20 p.696 6, 10, 18, 21, 23 p.696 27
§24.2 Newton's Method for Solving Equations	• Using Newton's method • Applications to electronics	p.700 5-19 p.700 28
§24.4 Related Rates	• Related rates problems involving electronics • Other related rates problems	p.707 11, 14, 16, 30 p.707 3-6, 12, 15, 21, 22, 24-28, 35, 37-43
§24.5 and §24.6 Using Derivatives in Curve Sketching	• Sketching polynomials • Sketching rational functions and functions involving square roots • Sketching functions related to electronics	p.714 5-32 p.719 2-18 p.714 41 and p.719 26, 28
§24.7 Applied Maximum/Minimum Problems	• Max/min problems related to electronics • Other max/min problems	p.724 5, 7, 11, 14, 38, 42 p.724 3, 13, 16-26, 28-34, 43, 44, 51, 52
Chapter 24 Review	• Tangent and Normal Lines • Newton's Method • Related rates problems involving electronics • Other related rates problems • Curve sketching • Max/min problems related to electronics • Other max/min problems	p.731 1-6, 41, 42 p.731 13-16, 44 p.731 50, 58 p.731 47, 66, 67, 70, 71, 75, 80 p.731 17-24, 55, 56 p.731 53, 67 p.731 69, 73, 76, 77, 79

Chapter 27 (Differentiation of Transcendental functions):

Textbook Section	Topic	Relevent Exercises
§27.1 Derivatives of the Sine and Cosine Functions	• Derivatives of sine and cosine functions • Implicit differentiation of sine and cosine functions • Applications to velocity/acceleration • Applictions to electronics	p.801 3-34, 43-46, 49 p.801 41, 42 p.801 50, 53 p.801 51, 54
§27.2 Derivatives of the Other Trigonometric Functions	• Derivatives of trigonometric functions • Implicit differentiation of trig. functions • Applications to velocity/acceleration • Applications to electronics	p.804 3-32, 43-47 p.804 33, 34 p.804 48, 49, 51 p.804 50
§27.3 Derivatives of Inverse Trigonometric Functions	• Derivatives of inverse trigonometric functions • Implicit differentiation of inverse trig. functions • Applications to velocity/acceleration • Applications to electronics	p.807 3-31, 34, 39, 41, 42, 45-48 p.807 32, 33 p.807 48, 49, 51 p.807 51
§27.4 Applications (Trigonometric Functions)	• Tangent and normal lines • Related rates problems involving electronics • Other related rates problems • Newton's method • Max/min problems • Applications to velocity/acceleration • Applications to electronics	p.811 4, 5, 9, 10 p.811 20 p.811 25-28 p.811 11, 12 p.811 14, 33 p.811 17 p.811 15, 16
§27.5 Derivative of the Logarithmic Function	• Derivatives of logarithmic functions • Implicit differentiation of logarithmic functions • Logarithmic differentation • Applications to electronics	p.816 3-31, 40-42, 45, 46, 53, 54 p.816 32-34 p.816 47, 48 p.816 50, 56
§27.6 Derivative of the Exponential Functions	• Derivatives of exponential functions • Implicit differentiation of exponential functions • Applications to electronics	p.819 3-24, 27-32, 36-38, 43-52 p.819 25, 26 p.819 53
§27.8 Applications (Logarithmic and Exponential Functions)	• Tangent and normal lines • Newton's Method • Applications to velocity/acceleration • Applications to electronics	p.826 17-20 p.826 21-22, 38 p.826 39, 40 p.828 23, 25, 28, 30, 34, 35
Chapter 27 Review	• Derivatives of transcendental functions • Implicit differentiation of transcendental functions • Tangent and normal lines • Newton's method • Related rates problems • Applications to velocity/acceleration • Applications to electronics	p.828 1-31, 35, 36, 38-40, 57, 58 p.828 32-34, 37 p.828 45-48 p.828 59, 60, 92 p.828 84, 87 p.828 67, 70 p.828 71, 82, 88

Chapter 25 (Integration):

Textbook Section	Topic	Relevent Exercises
§25.1 Antiderivatives	• Antiderivatives	p.731 5-40
§25.2 The Indefinite Integral	• Indefinite integrals involving polynomials • Applications to velocity/acceleration • Applications to electronics	p.741 5-40, 47-49, 59, 60 p.741 50 p.741 53, 54, 56
§25.3 The Area Under a Curve	• Approximating areas under a curve	p.747 5-23
§25.4 The Definite Integral	• Definite integrals involving polynomials • Applications to electronics	p.750 3-38, 41 p.750 42, 50
§25.5 The Trapezoid Rule	• Trapezoid Rule	p.753 3-14, 19, 20
§25.6 Simpson's Rule	• Simpson's Rule	p.757 3-12, 15, 16, 18
Chapter 25 Review	• Indefinite integrals involving polynomials • Definite integrals involving polynomials • Trapezoid Rule • Simpson's Rule • Applications to electronics	p.758 1-10, 13-16, 19-22, 25, 26, 31, 32, 54, 58 p.758 11, 12, 17, 18, 23, 24, 29, 30, 34-36, 48 p.758 37, 39, 45, 46, 50 p.758 41, 47, 51 p.758 53, 56, 7 (Practice Test)

Chapter 26 (Applications of Integration):

Textbook Section	Topic	Relevent Exercises
§26.1 Applications of Integration	• Applications to velocity/acceleration • Applications to electronics	p.764 3-16 p.764 17-24, 27
§26.2 Areas by Integration	• Area between curves • Applications to electronics	p.769 3-30, 37, 38 p.769 44
§26.6 Other Applications (*time permitting)	• Work done by a variable force • Force due to liquid pressure • Average value of a function	p.791 5-20 p.791 21-30 p.791 31-33
Chapter 26 Review	• Applications to velocity/acceleration • Applications to electronics • Area between curves • Work done by a variable force (*time permitting) • Force due to liquid pressure (*time permitting) • Average value of a function (*time permitting)	p.794 1-6, 41, 53 p.794 8-10 p.794 13-20, 39, 40 p.794 37, 38, 44 p.794 42, 49, 50 p.794 51, 52

Chapter 28 (Methods of Integration) :

Textbook Section	Topic	Relevent Exercises
§28.1 The General Power Formula	• Indefinite integrals • Definite integrals • Areas by integration • Applications to electronics	p.834 3-8, 11-16, 19-24, 27-30, 35, 36 p.834 17, 18, 25, 26 p.834 31, 34 p.834 39
§28.2 The Basic Logarithmic Form	• Indefinite integrals • Definite integrals • Applications to electronics	p.838 3-10, 13-18, 21-28, 33, 34, 37, 40 p.838 11, 12, 19, 20, 29, 30, 32, 38, 39 p.838 45, 48
§28.3 The Exponential Form	• Indefinite integrals • Definite integrals • Areas by integration • Applications to electronics	p.841 3-10, 13-16, 19-24, 27, 28, 31-34, 36 p.841 11, 12, 17, 18, 25, 26, 42 p.841 29, 30, 40 p.841 41
§28.4 The Basic Trigonometric Forms (*time permitting*)	• Indefinite and definite integrals • Areas by integration • Applications to electronics	p.845 3-26, 31 p.845 27, 28 p.845 36
§28.6 Inverse Trigonometric Forms (*time permitting*)	• Indefinite and definite integrals	p.853 3-30
Chapter 28 Review	• Indefinite integrals • Definite integrals • Areas by integration • Applications to electronics	p.873 1-3, 7-8, 15, 16, 19-21, 23, 25-27, 41, 42, 49, 54 p.873 4, 5, 10, 11, 28, 37 p.873 60 p.873 76

CALCULUS

(for Electronics Engineering Technology)
201-NYA-05 Section 07 - WINTER 2011

INSTRUCTOR: ÉMILIE RICHER

CONTACT INFORMATION:
8A.11 (TEACHER'S UNION OFFICE) *YOU CAN WALK RIGHT IN WITHOUT KNOCKING, MY DESK IS IN THE BACK
514.931.8731 EXT 1802
ericher@dawsoncollege.qc.ca   ***DO NOT USE LÉA TO CONTACT ME!**

WEBSITE:

> # WWW.OBEYMATH.ORG
> You should check the website on a regular basis for any information pertaining to the course. Homework, news, assignments will be posted there.

YOUR GRADES ONLINE:
Your grades will be posted online on a regular basis on LÉA which can be accessed through the Dawson College website. BUT remember not to use LÉA messaging in order to contact me.

CLASS SCHEDULE:

Mondays, 10:00am – 11:30am, room 3.F.34
Wednesdays, 10:00am – 11:30am, room 3.F.34
Fridays, 10:00am – 12:00pm, room 3.E.11

OFFICE HOURS/EXTRA HELP:
Office hours are subject to change throughout the semester. An up to date schedule of office hours will be posted on the course website indicated above. Students can contact me at anytime to schedule office hours outside the posted periods.

MISSING A CLASS:
If for any reason you miss class, it is imperative that you do not fall behind. It is **YOUR RESPONSIBILITY** to make up any missed material, whether you have a valid reason for missing class or not. I will post the weekly material on the website so that you know what has been covered. However you should get the class notes from a fellow student (I will not provide you with my class notes) and then you should attempt to learn the missed material. This includes reading the notes and attempting related homework exercises. Once you have done these two things, if you are still having trouble understanding the material you should come to my office hours where we can work together. Do not come to office hours however, expecting me to reteach the lecture that you missed.

CELL PHONES:
If you are caught using or talking on your cellular phone, text messaging, or if your cellular phone rings, more than once over the course of the semester, you will be **ASKED TO LEAVE** for the remainder of the class in which the cellular phone was used.

CHEATING:
If you are caught cheating or if you are suspected of cheating you will be reported to the Dean. During tests, you should avoid any suspicious behavior. This means absolutely no talking, eyes on your test at all times, no sharing erasers or calculators etc.

EVALUATION:

30% = 3 Tests (2 hours in duration) worth 10% of the final mark each
20% = 6 Assignments **&** 6 Quizzes
50% = Final Exam

IMPORTANT NOTES REGARDING EVALUATION
- There is NO POSSIBILITY of writing any test or quiz on a different date than that indicated below or announced in class.
- Upon presentation of a valid medical note the weight of the missed evaluation will be transferred to the weight of the final exam.
- The valid medical note MUST be presented within a week of the student's return to classes or the expiration of the medical note (whichever comes first).

SCHEDULE OF TERMWORK:

These dates are fixed unless otherwise announced in class. The date change must be announced a minimum of 2 weeks in advance.

WEEK	DATE OF EVALUATION	TYPE OF EVALUATION
WEEK 1 (Jan.19th – Jan.23rd)	FRI Jan.21st	Quiz 1
WEEK 2 (Jan.24th – Jan.30th)	FRI Jan.28th	Quiz 2
WEEK 3 (Jan.31st – Feb.6th)	FRI Feb.4th	Assignment 1
WEEK 4 (Feb.7th – Feb.13th)	FRI Feb.11th	Quiz 3
WEEK 5 (Feb.14th – Feb.20th)	FRI Feb.18th	Assignment 2
WEEK 6 (Feb.21st – Feb.27th)	FRI Feb.25th	**TEST 1**
WEEK 7 (Feb.28th – Mar.6th)	FRI Mar.4th	Quiz 4
WEEK 8 (Mar.7th – Mar.13th)	FRI Mar.11th	Assignment 3
STUDY BREAK (Mar.14th – Mar.20th)	STUDY BREAK	**STUDY BREAK**
WEEK 9 (Mar.21st – Mar.27th)	FRI Mar.25th	Assignment 4
WEEK 10 (Mar.28th – Apr.3rd)	FRI Apr. 1st	**TEST 2**
WEEK 11 (Apr.4th – Apr.10th)	FRI Apr.8th	Quiz 5
WEEK 12 (Apr.11th – Apr.17th)	FRI Apr.15th	Assignment 5
WEEK 13 (Apr.18th – Apr.24th)	**WED** Apr. 20th	Quiz 6
WEEK 14 (Apr.25th – May 1st)	FRI Apr. 29th	Assignment 6
WEEK 15 (May.2nd – May.8th)	FRI May 6th	**TEST 3**
WEEK 16 (May.9th – May.13th)	FRI May 13th	Last day of classes & REVIEW FOR EXAM