DAWSON
COLLEGE

Mathematics Department
Introduction to Applied Mathematics
201-912-DW Section 1
Fall 2012

Instructor:	Yann Lamontagne
Office:	3B.19
Office Hours:	Office hours are posted beside the door of office 3B.19 and on the website.
Telephone:	(514) 931-8731 #1252
E-mail:	`ylamontagne@dawsoncollege.qc.ca`
Website:	`http://www.obeymath.org` 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.
Teacher Accessability:	For out of class communication please see me during my office hours.

Term Work: *(60% of final grade, see Evaluation)*:

3 Class Tests*	worth a total of 40%	on:
	Test 1	**Friday October 5th in room 4C.1**
	Test 2	**Thursday November 1st in room 4C.1**
	Test 3	**Thursday November 29th in room 4C.1**

Other evaluation activities worth a total of 20%: **usually but not limited to an activity per week**

* Each class test is an hour and half in duration.

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 COLLEGE

Mathematics Department
Applied Mathematics for Civil Technology
201-912-DW

COURSE OBJECTIVES

The purpose of this course is to upgrade students' mathematical abilities, for application to problems arising in Civil Engineering Technology. Particular emphasis will be placed on geometry, analytic geometry, and trigonometry. In addition, some high school algebra topics will be reviewed.

COURSE COMPETENCIES

This course will allow the student to fully achieve the competency:

01X2: To solve mathematical problems related to buildings and public works.

Elements of the Competency:

1. To examine the elements of a problem situation.
2. To establish quantity ratios and percentages.
3. To apply trigonometric methods.
4. To apply vector calculation methods.
5. To calculate distances, areas and volumes.
6. To present the results and justify the problem-solving process.

PRE-REQUISITE

Registration in Civil Engineering Technology and High School Functions or the equivalent CEGEP Mathematics course (Math 201-015-50).

PONDERATION

3-2-3

EVALUATION SCHEME AND SCHEDULE

The Institutional Student Evaluation Policy (ISEP) is designed to promote equitable and effective evaluation of student learning and is therefore a crucial policy to read and understand. The policy describes the rights and obligations of students, faculty, departments, programs, and the College administration with regard to evaluation in all your courses, including grade reviews and resolution of academic grievance. ISEP is available on the Dawson website.

Term Work

The term work is based on a minimum of 4 ½ hours of tests/quizzes. A minimum of 3 class tests will be given.

Final Examination

The Final Examination will be a supervised, comprehensive examination held during the formal examination period.

Grading Policy

Grading will be based on:

Final examination	40%
Term work	60%

REQUIRED TEXT AND MATERIALS

Text:

Combat Mathematics: Technical Problems for Civil Engineering**,** Rene de Graaf
Precalculus, version 3**,** Carl Stitz and Jeff Zeage, 2011, http://www.stitz-zeager.com
Trigonometry, Michael Corral, 2009, http://www.mecmath.net/trig

Calculator: A scientific calculator, which has no text storage or graphing capabilities, is required for class, class tests and the final exam.

TEACHING METHODS

Explanatory presentations, followed by in class problem sessions, and supplemented by assignments.

Problem solving is an essential component of this course. You will be expected to solve word problems, and to present your solutions to these and all other problems in a logical and coherent fashion. Answers should be clearly stated, with appropriate units of measurement included. Marks may be deducted for work that is inadequate in these respects.

ATTENDANCE AND COURSE PARTICIPATION REQUIREMENTS

Students should refer to the Institutional Student Evaluation Policy (ISEP section III-C) regarding attendance.
Attendance is recommended for the successful completion of the course.

LITERACY STANDARDS

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.

STUDENT OBLIGATIONS

(a) Students have an obligation to arrive on time and remain in the classroom for the duration of scheduled classes and activities.

(b) 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.

(c) 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.

(d) Electronic/communication devices (including cell phones, mp3 players, etc.) have the effect of disturbing the teacher and other students. All these devices must be turned off and put away. Students who do not observe these rules will be asked to leave the classroom.

Everyone has the right to a safe and non-violent environment. Students are obliged to conduct themselves as stated in the Student Code of Conduct and in the ISEP section on the roles and responsibilities of students. (ISEP section II-D)

ACADEMIC INTEGRITY

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 Examination
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.

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 in the course, to suspension or expulsion from the college.

According to ISEP, the teacher is required to report to the Sector Dean all cases of cheating and plagiarism affecting a student's grade. (see ISEP section IV-C.)

INTENSIVE COURSE CONFLICTS & POLICY ON RELIGIOUS OBSERVANCE

If a student is attending an intensive course, the student must inform the teacher, within the first two weeks of class, of the specific dates of any anticipated absences.

Students who wish to observe religious holidays must also 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.

Students who intend to observe religious holidays or who take intensive courses must inform their teachers in writing as prescribed in the ISEP Policy on Religious Observance. (ISEP Section III-D).

A form for this purpose is available at the end of this document.

MATH TUTORIAL ROOM

Volunteer math teachers are available for help in room 7B.1 from 10:00 to 16:00 (Monday through Friday) and from 17:00-18:00 (Monday through Thursday).

COURSE CONTENT & Tentative SCHEDULE

(the number of classes listed is approximate)

Review, Algebra and Other (1 week)

notes Rules of Exponents
notes Approximate Numbers
Significant Digits, Accuracy and Precision
Rounding
Operations with Approximate Numbers
notes Ratio and Proportions
Change of Units

Introduction to Functions (1 week) *(using Precalculus by Carl Stitz and Jeff Zeager)*

§1.3	Introduction to Functions	#1-47
§1.4	Function Notation	#1-34, 37-66, 68
§1.7	Transformations	#1-53
§5.1	Function Composition .	#1-24
§5.2	Inverse Functions	#1-20

Linear and Quadratic Functions (2 weeks) *(using Precalculus by Carl Stitz and Jeff Zeager)*

§2.1	Linear Functions	#1-26
§2.3	Quadratic Functions	#1-9, 17, 21, 26, 31-26
§2.4	Regression *(teach equation)*	#1-3

Exponential and Logarithmic Functions (2 weeks) *(using Precalculus by Carl Stitz and Jeff Zeager)*

§6.1	Introduction to Exponential and Logarithmic Functions	#1-76
§6.2	Properties of Logarithms	#1-29
§6.3	Exponential Equations	#1-33
§6.4	Logarithmic Equations	#1-24
notes	Applications of Exponential and Logarithmic Functions	

Systems of Equations (2 weeks) *(using Precalculus by Carl Stitz and Jeff Zeager)*

Systems of Linear Equations

§8.1	Gaussian Elimination	#1-26
§8.5	Cramer's Rule	#1-7, 9-16
notes	Application: Finding Quadratic Equation Given Three Points on the Graph.	
notes	Application: Mixture Problems.	

Systems of Non-Linear Equations

§7.2	Circles	#1-16
§7.4	Ellipses	#1-14
§8.7	Systems of Non-Linear Equations	#1-15

Trigonometry (3 weeks) *(using Trigonometry by Michael Corral)*

Right Triangle Trigonometry

§1.1	Angles	#1-10
§1.2	Trigonometric Functions of an Acute Angle	#1-18, 37-40
§1.3	Applications and Solving Right Triangles	#1-5, 15-23, 26-29
§1.4	Trigonometric Functions of Any Angle	#1-36
notes	Operations with Approximate Angles	

General Triangles

§2.1	The Law of Sines	#1-9, 15
§2.2	The Law of Cosines	#1-16
§2.4	The Area of a Triangle	#1-7
§2.5	Circumscribed and Inscribed Circles	#1-6

Trigonometric Identities

§3.1	Basic Trigonometric Identities	#4-15
§3.2	Sum and Difference Formulas	#2-5, 7-14
§3.3	Double-Angle	#1-8

Radian Measure

§4.1	Radians and Degrees	#1-10
§4.2	Arc Length	#1-11
§4.3	Area of a Sector	#1-19
§4.4	Circular Motion: Linear and Angular Speed	#1-7, 11

Graphing and Inverse Functions

§5.1	Graphing the Trigonometric Functions	#1-4, 9-10
§5.2	Properties of Graphs of Trigonometric Functions.	#1-7

Solving Trigonometric Equations

§6.1	Solving Trigonometric Equations	#1-12

Vectors (2 weeks) *(Precalculus by Carl Stitz and Jeff Zeager)*

§11.8	Introduction to Vectors	#1-52, 58-61
§11.9	Dot Product	#1-20
notes	Application: Finding and Solving: Equations from Statics Equilibrium Conditions	

Geometry & Applied Problems (2 weeks) *(Combat Math.: Tech. Problems for Civil Engineering by Rene de Graaf)*

General Geometry

notes	Corresponding angles
notes	Similar Triangles
notes	Area of Quadrilaterals
notes	Volume of Solid Geometric Figures

Lengths

Areas

Volumes

RELIGIOUS OBSERVANCE/ INTENSIVE COURSES FORM

Students who intend to observe religious holidays or who take intensive courses must inform their teachers in writing as prescribed in the ISEP Policy on Religious Observance. (ISEP Section III-D)

The following form must be submitted within the first two weeks of classes.

Name: _____

Student Number: _____

Course: _____

Teacher:_____

Date:	**Description:**
_____	_____
_____	_____
_____	_____
_____	_____