DAWSON COLLEGE

Mathematics Department
Engineering Math II – Mech. Tech.
201-942-DW

COURSE OBJECTIVES

The object of this course is to enable the student to solve problems in differential and integral calculus. Emphasis will be placed, whenever possible, on examples directly dealing with the student's area of study.

COURSE COMPETENCIES

This course contributes to the partial achievement the competency:

012E: To solve problems related to industrial mechanics.
Elements of the Competency:

1. To analyze situations involving variables.
2. To identify dimensions and coordinates for complex objects.
3. To prepare estimates using matrices.
4. To analyze the forces exerted on an object.
5. To analyze the variables of outputs, speeds and accelerations.
6. To extend to different fields of application.

PRE-REQUISITE

201-941-DW Applied Mathematics

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

A minimum of 3.5 hours of in-class testing is required.

Final Examination

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

Grading Policy

The final grade is calculated according to the following scheme:

1. Term Mark (tests, quizzes, assignments) 60%
2. Final examination 40%

To pass the course the students must obtain at least **60%**.

REQUIRED TEXT AND MATERIALS

Text: *Technical Mathematics with Calculus* (Calter, Calter, Wraight, White) (3rd edition)

References: *Basic Technical Mathematics with Calculus SI Version (Metric) (10th edition)* by A.J. Washington.

CALCULATORS

Students are only permitted to use the Sharp EL-531X, XG or XT calculator during tests and examinations.

TEACHING METHODS

Lectures and problem sessions.

ATTENDANCE AND COURSE PARTICIPATION REQUIREMENTS

Students should refer to the Institutional Student Evaluation Policy (ISEP section IV-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 V-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 observing religious holidays must **inform** each of their teachers, in writing, of the specific dates as soon as possible, but **no later than the end of the second week of the impacted semester or term.** Alternative arrangements convenient to both the student and the teacher must be made at the earliest opportunity. In the event that the date of a religious observance has yet to be determined, students must submit the name of the observance to their teachers and provide them with the specific date(s) as soon as it becomes available. This applies both to the semester or term, as well as to any final examination period. 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. (ISEP Section IV-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 *(number of classes listed is approximate)*

27 – Derivatives of Algebraic Functions (13 Classes)
27.1 – Limits (page 657, Ex. 1-12, 15-17, 22-24)
27.2 – The Derivative (page 665, Ex. 1-10, 19-24)
27.3 – Rules for the Derivative (page 668, Ex. 1-60)
27.4 – Derivative of a Function Raised to a Power (page 671, Ex. 1-10, 13-22)
27.5 – Derivatives of Products and Quotients (page 675, Ex. 1-18, 21, 27-42)
27.6 – Derivatives of Implicit Relations (page 679, Ex. 13-28)
27.7 – Higher Order Derivatives (page 680, Ex. 1-10)
Review Problems (page 680, Ex. 1-6, 8-9, 11, 13, 15-20, 22-23, 26-40)

28 – Graphical Applications of the Derivative (3 Classes)
28.1 – Tangents and Normals (page 684, Ex. 1-6)
28.2 – Maximum, Minimum, and Inflection Points (page 692, Ex. 1-26)

29 – Applied Applications of the Derivative (6 Classes)
29.1 – Rate of Change (page 702, Ex. 1, 3, 5-8)
29.2 – Motion of Point (page 708, Ex. 1-15, 19-25)
29.3 – Related Rates (page 712, Ex. 1-13) (page 714, Ex. 17-25, 28-29)
29.4 – Optimization (page 719, Ex. 1-15, 19-21) (page 721, Ex. 26-30) (page 722, Ex. 36, 37)
Review Problems (page 722, Ex. 2, 4, 5-8, 11, 13, 17-19, 21)

30 – Integration (8 Classes)
30.1 - The Indefinite Integral (page 730, Ex. 1-18)
30.2 – Rules for Finding Integrals (page 735, Ex. 1-15)
30.3 – Constant of Integration (page 738, Ex. 1-6)
30.4 – The Definite Integral (page 740, Ex. 1-6)
30.6 – Exact Area Under a Curve (page 747, Ex. 1-7)
Review Problems (page 747, Ex. 1-7, 13, 16)

31 – Applications of the Integral (2 Classes)
31.1 – Applications to Motions (page 751, Ex. 1-13)
31.3 – Finding Areas by Means of Definite Integral (page 759, 1-23)

35 – Differential Equations (1 Class)
35.1 – Definitions (page 847, Ex. 1-6) (page 848, Ex. 7-15)

32 – More Applications of the Integral (5 Classes)
32.1 – Length of Arc (page 771, Ex. 1-14)
32.2 – Centroids (page 779-780, Ex. 1-15, 22-23)
32.5 – Work (page 785, Ex. 1-7)

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:**