



Mathematics Department
Calculus III – Science
201-BZF-05

COURSE OBJECTIVES

For details, see “Dawson Science Program”.

COURSE COMPETENCIES

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

00UV: To apply the experimental method in a scientific field.

1. To represent various situations, drawing upon relevant concepts, laws and principles of science.
2. To solve problems using a method proper to science.
3. To apply techniques of experimentation or validation specific to science.

PRE-REQUISITE

Calculus 2 (Mathematics 201-NYB-05) or equivalent and in Linear Algebra (Mathematics 201-NYC-05) or equivalent.

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 3 ½ hours of tests/quizzes.

Final Examination

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

Grading Policy

A student's grade shall consist of the greater of:

(A) Term work for 50% and Final Exam for 50%.

OR

(B) Term work for 25% and Final Exam for 75%.

To pass the course the student must obtain at least 60%.

Comprehensive Examination

N.B. For a Science (200.xx) student who elects to do the Comprehensive Examination (CE) in this section, the teacher will evaluate the CE on a pass/fail basis.

A STUDENT CANNOT GRADUATE UNTIL ALL ASPECTS OF THE COMPREHENSIVE EXAMINATION INCLUDING THE INDEPENDENT PROJECT ARE SUCCESSFULLY COMPLETED.

REQUIRED TEXT AND MATERIALS

Text: The required text is Multivariable Calculus, by James Stewart, 8th Edition (ISBN-10: 1-305-26664-1)

References:

- (1) Vector Calculus by Michael Corral (available online at: www.mecmath.net/calc3book.pdf)
- (2) Apex Calculus III by Hartman et al. (available online at: www.apexcalculus.com/s/CalculusIII_Version2.pdf)
- (3) Advanced Calculus, Schaum's Outline Series

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)

Chapter 11 – Infinite Series (2 weeks)

- Review of Sequences and Series 11.1- 11.4,11.6, 11.7
- Alternating Series 11.5 (1-20, 23-30)
- Power series 11.8 (1-33)
- Functions as power series 11.9 (1-20, 25-32)
- Maclaurin and Taylor Series 11.10 (1-26, 53-65)

Chapter 10 – Parametric equations and polar coordinates (1 week)

- Curves defined by parametric equations 10.1 (1-22)
- Calculus with parametric equations 10.2 (1-8, 11-20)
- Polar coordinates 10.3 (1-46)

Chapter 13 – Vector Functions (three weeks)

- Vector Functions and Space Curves 13.1 (1-6, 17-20, 21-26)
- Derivatives and integrals of vector functions 13.2 (9-26, 35-40)
- Arc Length and Curvature 13.3 (1-6, 16-23)
- Motion in Space 13.4 (3-16,17, 18, 37-42)

Chapter 14 – Partial Derivatives (four weeks)

- Functions of Several Variables 14.1 (9-31)
- Limits & Continuity 14.2 (1, 5-22, 29-38, 44)
- Partial Derivatives 14.3 (15-44, 47-50, 53-58)
- Tangent Planes and Differentials 14.4 (1-6, 11-16, 25-30)
- The Chain Rules 14.5 (1-12, 21-34,45,46)
- Directional Derivatives and Gradient 14.6 (7-17, 21-26, 41-46)
- Maximum and Minimum Values 14.7 (5-20, 31-38,41-45)
- Lagrange Multipliers 14.8 (3-14, 21-23)

Chapter 15– Multiple Integrals (four weeks)

- Double Integrals over rectangles 15.1 (1-4, 15-34,47-50)
- Double integrals over general regions 15.2 (1-10, 15-32, 49-50,51,52)
- Double integrals in polar coordinates 15.3 (7-27)
- Applications of Double Integrals 15.4 (1-20)
- Triple Integrals 15.6 (3-22)
- Triple Integrals in cylindrical coordinates 15.7 (17-30)
- Triple integrals in spherical coordinates 15.8 (21-30,35,41)

RELIGIOUS OBSERVANCE/ INTENSIVE COURSES FORM

Students who intend to observe religious holidays must inform their teachers, in writing, within the **first two weeks of the semester** as prescribed in the ISEP Policy on Religious Observances. (ISEP, Section IV-D). This includes any religious holidays that occur during the final exam period. Please refer to the academic calendar for the exact dates.

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

Name: _____

Student Number: _____

Course: _____

Teacher: _____

Date:

Description:
