

DAWSON COLLEGE
MATHEMATICS DEPARTMENT
CALCULUS III
201-BZF-05
(formerly 201-303)
STUDY GUIDE

Ponderation: 3-2-3

Prerequisite: Calculus 2 (Mathematics 201-NYB-05).
Linear Algebra (Mathematics 201-NYC-05).

Objectives: The course is divided into four areas:
infinite series, vector functions, partial derivatives and multiple integrals.

1. The course continues the discussion of infinite series begun in Calculus 2 with the following topics:
 - Review of tests for convergence of positive series;
 - Conditional and absolute convergence of alternating series;
 - Convergence of power series; Taylor series;
 - Computations with power series.
2. The topic of vector functions and space curves is introduced. Derivatives, integrals, arc length, unit tangent and normal vectors, curvature, tangential and normal components of acceleration will be covered with applications (if time permits) to ballistics and motion in space.
3. The standard topics on partial differentiation will be covered including the chain rules, directional derivatives and gradients, tangent planes and normal lines, implicit functions, finding local extrema and optimization problems with one constraint.
4. In multiple integration we shall cover area, volumes, centroids and moments of inertia. Where appropriate the student will see these problems in other coordinate systems including cylindrical and spherical coordinates.

Text: Multivariable Calculus, by James Stewart, 5th Edition
ISBN 0-534-39357-8.

References:

Calculus of Several Variables, by Edwards & Penney
Calculus of Several Variables, by R. Adams
Advanced Calculus, Schaum's Outline Series

Termwork: The term grade is based on a minimum of 4½ hours of tests/quizzes.
A minimum of 3 class tests will be given.

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

(A) Termwork for 50% and Final Exam for 50%

OR

(B) Final Exam for 100%.

To qualify for (B) the student must have obtained at least 50% of the term marks and have written more than 50% of the class tests.

The standard of performance for this course is a final average of 60%.

N.B. For a Science (200.xx) student who elects to do the Comprehensive Assessment in this section, the above scheme represents 90% of his/her final grade. The Assessment makes up the other 10%. IF A STUDENT FAILS (i.e. obtains less than 60%) THE ASSESSMENT, HE/SHE CANNOT GRADUATE.

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:

(Times are approximate)

<u>Chapter 12 – Infinite Series</u> (three weeks)	Section
• Review of Sequences and Series	1-4
• Alternating Series; Absolute and Conditional Convergence	5-7
• Power Series	8, 9
• Taylor and MacLaurin Series	10
 <u>Chapter 13.6 – Quadric Surfaces</u> (two periods)	
 <u>Chapter 14 – Vector Functions</u> (three weeks)	
• Vector Functions and Space Curves	1-2
• Arc Length and Curvature	3
• Motion in Space: Velocity and Acceleration (Omit Kepler's Laws)	4
 <u>Chapter 15 – Partial Derivatives</u> (four weeks)	
• Functions of Several Variables, Limits & Continuity	1, 2
• Partial Derivatives	3
• Tangent Planes and Differentials	4
• The Chain Rules	5
• Directional Derivatives and the Gradient Vector	6
• Maximum and Minimum Values	7
• Lagrange Multipliers (one constraint)	8
 <u>Chapter 16 – Multiple Integrals</u> (four weeks)	
• Double Integrals; Iterated Integrals	1-3
• Double Integrals in Polar Coordinates	4
• Applications of Double Integrals	5
• Triple Integrals	7
• Triple Integrals in Cylindrical and Spherical Coordinates	8
• (See also Section 13.7 on Cylindrical and Spherical Coordinates)	

Methodology: Lectures and problem sessions.

Calculators: A non-programmable calculator without text storage or graphing capabilities is allowed.

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 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.
- (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.