



Mathematics Departments
Calculus II – Social Science
201-203-DW

COURSE OBJECTIVES

To find integrals involving algebraic, exponential, logarithmic and trigonometric functions (using standard integration techniques). To apply integral calculus in solving problems in business and economics. To find Taylor polynomial expansions for familiar functions. To classify infinite series as convergent or divergent.

COURSE COMPETENCIES

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

022Y: To apply methods of integral calculus to the study of functional models in the field of Social Science.

Elements of the Competency:

1. To situate the historical context of the development of integral calculus.
2. To find the indefinite integral of a function using integration techniques.
3. To calculate the definite integral of a function on an interval and provide its interpretation.
4. To calculate the limits of a function with indeterminate forms using L'Hôpital's rule.
5. To calculate the improper integral of a function on an interval and provide its interpretation.
6. To analyze a phenomenon using differential equations with separable variables.
7. To analyze a phenomenon by checking for convergence of a series.

This course also contributes to the partial achievement of the competency:

022S: To apply concepts related to Social Science disciplines to the understanding of the human phenomena in concrete situations.

Elements of the Competency:

1. To identify concrete situations that lend themselves to study.
2. To use concepts applicable to these situations.
3. To use a strategy appropriate to the study of these situations.

PRE-REQUISITE

Calculus I (201-103-DW) 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

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 the greatest between:

Option A

Term Mark (tests, computer quizzes, assignments)	50%
Final Examination	50%

Option B

Term Mark (tests, computer quizzes, assignments)	25%
Final Examination	75%

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

REQUIRED TEXT AND MATERIALS

Text: The required text is: **Applied Calculus for the Managerial, Life and Social Sciences (10th Edition)** by S. T. Tan. (Thomson Brooks/Cole Publishers)

References

- (1) Calculus with Applications (9th edition) by Lial, Greenwell and Ritchey (**Addison Wesley Publishers**)
- (2) Calculus: An Applied Approach (9th Edition) by Ron Larson (**Brooks/Cole Publishers**)

Calculators

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

TEACHING METHODS

Lectures / problem solving sessions / computer labs

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 Exams

Plagiarism is the presentation or submission by a student of another person's assignments or exams 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-Friday) and from 17:00-18:00 (Monday- Thursday).

COURSE CONTENT & TENTATIVE SCHEDULE

<u>Topics & Specific Competencies</u>	<u>Learning Activities</u>		
Integration (17 classes*)	Section	Pages	Exercises
Indefinite Integrals and Simple differential equations	6.1	418	9-62, 68-70
Integration by substitution	6.2	430	1-56, 58-61, 65
	12.4	830	1-4, 7, 15-16, 21-24, 28
Additional integration [SUPPLEMENTARY NOTES – HANDOUT]			
The Riemann Sum and the Definite Integral [SUPPLEMENTARY NOTES – HANDOUT]			
The Fundamental Theorem of Calculus	6.4	453	1-40, 43-45
	12.4	830	11-12, 29-30
Definite integrals by substitution	6.5	463	1-34, 47
Average value of a function	6.5	463	35-44, 51, 53, 58, 61
Area between curves (polynomials)	6.6	475	1-21, 27-31, 35-39
Applications (business & economics) (Consumers' surplus and producers' surplus)	6.7	490	1-5, 8, 10-11
OPTIONAL – The Present and Future Value of An Income Stream	6.7	490	12, 15-17
Chapter 6 Review Exercises		496	1-35, 47-51, 53-54, 60
Additional Topics in Integration (15 classes*)	Section	Pages	Exercises
Integration by Parts	7.1	507	1-20, 23-25, 27, 29-34
Integration by Partial Fractions [SUPPLEMENTARY NOTES – HANDOUT] (Proper and improper rational expressions)			
Numerical Integration (The Trapezoidal Rule and Simpson's Rule)	7.3	528	1-22
Introduction to L'Hôpital's Rule [SUPPLEMENTARY NOTES – HANDOUT] (Indeterminate forms of type $0/0$, ∞/∞ , $0 \cdot \infty$ and $\infty \cdot \infty$)			
More L'Hôpital's Rule (Appendix B2)		846	1-12, 14-17, 20, 22-23, 25-26

Improper Integrals	7.4	539	5-14, 17-43, 45-46
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Chapter 7 Review Exercises		550	1-8, 15-24
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Differential Equations (4 classes*)

	Section	Pages	Exercises
Verify proposed solutions	9.1	649	1-11, 13-17, 29-32
Separation of variables (First-order separable differential equations)	9.2	655	1-11, 13-24, 26-27

Chapter 9 Review Exercises		676	1-3, 5-11
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Taylor Polynomials and Infinite Series

(9 classes*)

	Section	Pages	Exercises
The n th Taylor Polynomial	11.1	733	1-26
Infinite Sequences	11.2	742	1-10, 13-14, 17-19, 21, 30-43
Infinite Series (Telescoping and geometric series)	11.3	753	1-26
Series with positive terms (Test for divergence, p -series, and integral and comparison tests)	11.4	763	1-15, 17-19, 21-35
Chapter 11 Review Exercises		793	1-5, 11-22, 25-31
Chapter 12 Review Exercises		835	26, 29-32, 35-36

*** The times indicated are approximate.**

RELIGIOUS OBSERVANCE/ INTENSIVE COURSE 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 IV-D)

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

Name: _____

Student Number: _____

Course: _____

Teacher: _____

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