



North South University

Department of Mathematics and Physics

MAT130 : Calculus and Analytical Geometry II

Course Name: Calculus and Analytical Geometry II

Course Code: MAT 130

Credit Hours: 3 Credits

Pre-requisite: MAT 120

Term : **Fall 2018**

Instructor : Dr. Hasina Akter
Assistant Professor
Department of Mathematics and Physics
North South University

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Office Time : ST: 11:20am -1:00pm, 3:00pm – 5:00pm
MW: 1:30pm – 2:30pm, and by appointment

Course Short Description: This course provides students an overview of the basic principle of integral, methodology of finding area between curves, length of a plane curve, surface area and volume by revolving plane curves using integration.

Course Objectives:

1. To classify different types of proper and improper integrals and find the appropriate techniques for finding values of integrals, and to analyse the area of bounded and unbounded regions.
2. To analyse the basic geometric properties of conic sections parabolas, ellipses, and hyperbolas.
3. To demonstrate student' understanding of the relationship between the exponential and hyperbolic functions, their graphs and the application of hyperbolic functions in the real life problems.
4. To develop the ability to apply the basic principles of integration to find the length of a curve, surface area of revolution, area between two curves and the volume of solids generated by revolution of curves.

Upon successful completion of this course, students will be able to:

Course Learning Outcomes:

(CO-1) Classify the type of a given integral and apply the appropriate technique for finding the value of the integral.

(CO-2) Formulate and evaluate integrals to find the length of curves, the area between curves, the area of unbounded regions, and the area of surfaces of revolution.

(CO-3) Analyze the structure of solids generated by revolution of a region bounded by curves to evaluate volume.

(CO-4) Illustrate parametric curves and conic sections, and analyze their various properties.

(CO-5) Develop the ability to apply polar coordinates to find the area of regions bounded by polar curves.

Mapping of Course Outcomes

#	Course Outcomes (CO)	Bloom's taxonomy domain/level (C: Cognitive P: Psychomotor A: Affective)	Delivery methods and activities	Assessment tools
CO-1	Classify the type of a given integral and apply the appropriate technique for finding the value of the integral.	C2, C3	Lecture Group work	Quiz Midterm exam Class performance
CO-2	Formulate and evaluate integrals to find the length of curves, the area between curves, the area of unbounded regions, and the area of surfaces of revolution.	C3, C4, P2	Lecture Group work	Midterm exam Assignment
CO-3	Analyze the structure of solids generated by revolution of a region bounded by curves to evaluate volume.	C3, C4, P2	Lecture Discussion	Group work in class Quiz Assignment
CO-4	Illustrate parametric curves and conic sections, and analyze their various properties.	C4, P2	Lecture Discussion	Assignment Final Exam
CO-5	Develop the ability to apply polar coordinates to find the area of regions bounded by polar curves.	C2, C3, P2	Lecture	Quiz Assignment Final Exam

Marks Distribution:

Assessment Strategy and Grading Scheme	
Grading tool	Marks
Attendance and Class Performance	10%
Assignment	05%
Quizzes	10%
Midterm I	20%
Midterm II	20%
Comprehensive Common Final Exam	35%

Text Book:

Author	Howard Anton, Irl Bivens, Stephen Davis
Title	"Calculus, Early Transcendentals"
Edition & Year	10 th edition, 2013
Publisher	John Wiley & Sons, Inc
ISBN	978-1-11809240-8

Grading Policies:As per NSU grading policy.

Important dates:

First midterm TBA

Second midterm TBA

Course Final TBA

Rules and Restrictions:

- (a) Submit the assignments on recommended date. **No late submission will be accepted.** Make a photocopy of your assignment before submission.
- (b) There is **no scope to retake a quiz.** In case of Mid-term- or Final exam, exceptional cases*(unfortunate physical inability, accidents, serious illness) may be considered conditionally (with a **penalty of 20% reduced marks**) with proper justification.
- (c) Three consecutive absents need an official clarification.
- (d) Student having attendance **less than 60% of total classes will not be allowed to sit for Final Exam.**
- (e) If you are a **probation/retake student**, I would like to have you in 24 classes (**20 present is Must**)

Classroom Rules of Conduct:

- 1. Electronic devices e.g. **cell phone, laptop, notepad, iPad, iPod, mp3, etc** are strictly prohibited in the class.
- 2. It is imperative that the students maintain absolute discipline in class. Students are also expected to arrive on time for the class, as frequent late attendance will not be accepted.
- 3. **Academic Integrity Policy:** Department of Mathematics and Physics does not tolerate academic dishonesty by its students. At minimum, students must not be involved in cheating, copyright infringement, submitting the same work in multiple courses, significant collaboration with other individuals outside of sanctioned group activities, and fabrications.

Students are advised that violations of the Student Integrity Code will be treated seriously, with special attention given to repeated offences.

Please Refer to NSU Student Handbook, Sections: "Disciplinary Actions" and "Procedures and Guidelines".

Course Contents & Lecture Schedule:

Lesson	Topics	Learning activities	Assessment tools	Learning Outcome
1	7.2 :Integration by parts	Lecture	Class performance 1	CO-1
2	7.3: Trigonometric integrals	Lecture	Quiz 1, Mid-1 Assignment	CO-1
3	7.4: Trigonometric substitution	Lecture Group Activities	Quiz 1, Mid-1	CO-1
4	7.5: Integrating rational functions by partial fractions	Lecture	Quiz 1, Mid-1	CO-1
5	7.5: Integrating rational functions by partial fractions	Lecture	Mid-1 Assignment	CO-1
6	6.9: Hyperbolic functions and hanging cables	Lecture	Class performance 2	CO-1
7	6.9: Hyperbolic functions and hanging cables	Lecture	Mid-1	CO-1
8	Midterm I			
9	6.1: Area between two curves	Lecture	Quiz 2, Mid-2	CO-2
10	6.2: Volumes by slicing disks	Lecture	Quiz 2, Mid-2	CO-3
11	6.2: Volumes by slicing washers	Lecture	Quiz 2, Mid-2 Assignment	CO-3
12	6.3: Volumes by Cylindrical shells	Lecture Group Activities	Quiz 2, Mid-2	CO-3
13	6.4: Length of a plane curves	Lecture	Mid-2, Class performance 3	CO-2
14	6.5: Area of a surface of revolution	Lecture	Mid-2, Class performance 3	CO-2
15	Midterm II			
16	7.8: Improper Integrals	Lecture	Final, Quiz 3	CO-1, CO-2
17	7.8: Improper Integrals	Lecture, Group Activities	Final Assignment	CO-1, CO-2
18	10.1: Tangent lines and arc length for parametric curves	Lecture	Final, Class performance 4	CO-4
19	10.2: Polar coordinates, Area in polar coordinates	Lecture	Final, Quiz 3 Assignment	CO-5
20	10.3: Area in polar coordinates	Lecture	Final, Quiz 3	CO-5
21	10.4: Conic sections, parabola, ellipse	Lecture Group Activities	Final	CO-4
22	10.4: Conic sections ellipse, hyperbola	Lecture	Final	CO-4
23	10.6: Conic sections in polar coordinates	Lecture	Final, Assignment	CO-4
24	Review			
	Final Exam (Declared by Controller of Examinations)			

*****Thank You *****