CM-102

(Core – Skill and Knowledge)

COURSE DESCRIPTION

Course code number	CM-102	Course Title	Calculus II
Semester hours	3 hours	No. of Credit Units	3
Prerequisite	CM-101	Course Coordinator	

Course Description

This course covers applications and methods of integration, infinite series and the representation of functions by infinite polynomials known as power series and differential equations. The course aims to balance applications and theoretical understanding.

Textbook

Thomas' Calculus in SI Units, 14/E, Joel R. Hass, Christopher E. Heil and Maurice D. Weir.

Course Outcomes

Students who complete the course will

- understand the concepts and rules of integration,
- know different techniques for finding antiderivatives,
- understand that many familiar functions have representations as infinite polynomials (power series) whose coefficients are determined by derivatives evaluated at a single point
- have a solid notion of what it means for a series to converge
- be able to apply convergence tests
- understand the idea of radius of convergence of a power series
- model a situation using a differential equation or system of differential equations
- know what it means for a function to be a solution to a differential equation

Major Topics Covered in the Course

- Transcendental Functions

- Techniques of Integration

- Infinite Sequences and Series

- First-Order Differential Equations

- Second-Order Differential Equations

Assessment Plan for the Course

Class Attendance participation	-	10%
Quizzes	-	10%
Assignment	-	20 %
Test	-	10%
Final Exam	-	50%

Grading System

UCSY follows a letter grade system comprising of grades A, A-, B+, B, B-, C+, C, C-, D and F. All marks obtained by students during the semester will be used in the grading process. A grade of "D" is considered a passing grade for undergraduate courses. For undergraduate students, a grade of "C" or better is required in this course because it is a prerequisite for other courses in the program. **The student who gets the grade point less than 2 must do Re-Exam.**

The grading scale for this course is:

Marks obtained	Letter Grade	Grade Point
>=90	A	4
85 – 89	A-	3.75
80 – 84	B+	3.25
75 – 79	B	3
70 – 74	B-	2.75
65 – 69	C+	2.25
60 – 64	C	2
55 – 59	C-	1.75
50 – 54	D	1
0 – 49	F	0

Fail Grade and Re-Exam: C-, D, F (Grade point <2)

Tentative Lesson

No	Topics	Week	Remark
I	**Transcendental Functions**	Week 1	
1	Inverse Functions and Their Derivatives		
2	Natural Logarithms		
3	Exponential Functions		Assignment 1
4	Exponential Change and Separable Differential Equations	Week 2	
5	Indeterminate Forms and L Hopital's Rule		Assignment 2
6	Inverse Trigonometric Functions	Week 3	
7	Hyperbolic Functions		
8	Relative Rates of Growth		Assignment 3
II	**Techniques of Integration**	Week 4	
9	Using Basic Integration Formulas		
10	Integration by Parts		Assignment 4
11	Trigonometric Integrals	Week 5	
12	Trigonometric Substitotions		Assignment 5
13	Integration of Rational Functions by Partial Fractions	Week 6+7	
14	Numerical Integration		
15	**Test I**		
III	**Infinite Sequences and Series**	Week 8	
16	Sequences		
17	Infinite Series		Assignment 6
18	The Integral Test	Week 9	
19	Comparison Tests		
20	Absolute Convergence; The Ratio and Root Tests	Week 10	
21	Alternating Series and Conditional Convergence		
22	Power Series		Assignment 7
23	Taylor and Maclaurin Series	Week 11	
24	Convergence of Taylor Series		
25	Applications of Taylor Series		Assignment 8
IV	**First-Order Differential Equations**	Week 12	
26	Solutions, Slope Fields, and Euler's Method		
27	First-Order Linear Equations		
28	Applications		
29	Graphical Solutions of Autonomous Equations	Week 13	

No	Topics	Week	Remark
30	Systems of Equations and Phase Planes		Assignment 9
V	**Second-Order Differential Equations**	Week 14	
31	Second-Order Linear Equations		
32	Nonhomogeneous Linear Equations		
33	Applications		Assignment 10
34	Euler Equations	Week 15	
35	Power Series Solutions		
36	**Test II**		