International Islamic University Chittagong (IIUC)

Department of Computer Science and Engineering (CSE)

Mathematics

Syllabus for 4 Years B. Sc. Engineering Degree in
Computer Science and Engineering (CSE)
Semester: Autumn 2023

International Islamic University Chittagong
Faculty of Science and Engineering
Department of Computer Science and Engineering
Mathematics Syllabus for B. Sc. Engineering in CSE
Semester: Autumn 2023

Courses Code: MATH-1107
Course Title: Mathematics-I
Semester: Autumn 2023

Course Instructor's Contact Details:

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First Semester		
ISCED Code	**Course Code**	**Course Title**
0541	MATH-1107	Course Title: Mathematics-I (Differential and Integral Calculus)
Credit Hours: 3	Contact Hours: 3 per week	Type: Core, Math
Prerequisite: None		
Co-requisite: None		

Course Assessments	**CIE**: Continuous Internal Evaluation	Attendance	10 Marks
		Class test/ Assignment/ Quizzes	10 Marks
		Mid-term	30Marks
	SEE: Semester End Examination		50 Marks

Course Objectives:

The objective of this course is to provide the students with an understanding of how to find out the rate of change of various functions, and to determine the area and volume of different types of objects. This course aims to introduce the student with the various techniques of differentiation and integration.

Course Learning Outcomes (CLOs):

SL No.	CLO Description	Weightage (%)
1	Compute the functions, limit and continuity of a function, derivatives, integrals and extrema of single-variable and/or multi-variable functions.	15
2	Understand the techniques of differentiation and integration.	60
3	Demonstrate the applications of differentiation and integration.	15

Mapping of CLO-PLO:

#	CLO Description	PLOs	Bloom's Taxonomy Domain/Level	Delivery Methods and Activities	Assessment Tools
CLO1	Compute the functions, limit and continuity of a function, derivatives, integrals and extrema of single-variable and/or multi-variable functions.	PLO1	Cognitive/ Understanding Level 2	Lecture, Tutorial, Class Discussion, Problem Solving, Assignment, Home Work, Presentation Slides, Group Discussion Hand Note, etc.	**Exam** (Mid Term & Final) **Class Test** (Quizzes/ Assignment/ Class Performances/ Presentations)
CLO2	Understand the techniques of differentiation and integration.	PLO1	Cognitive/ Understanding Level 2	Lecture, Class Discussion, Problem Solving, Assignment, Home Work, Presentation Slides, Group Discussion Hand Note, etc.	**Exam** (Mid Term & Final) **Class Test** (Quizzes/ Assignment/ Class Performances/ Presentations)
CLO3	Demonstrate the applications of differentiation and integration.	PLO1	Cognitive/ Apply Level 3	Lecture, Class Discussion, Problem Solving, Assignment, Home Work, Presentation Slides, Group Discussion Hand Note, etc.	**Exam** (Mid Term & Final) **Class Test** (Quizzes/ Assignment/ Class Performances/ Presentations)

Course Content:

Segment	Contents	Duration	CLOs
Section-A (Midterm Exam: 30 Marks)			
1	Functions, Limits, Continuity and Differentiability, Physical meaning of the derivative of a function, Indeterminate Forms	08	**CLO1**
2	Differentiation, Successive differentiation and Leibniz theorem	06	**CLO2**
3	General Theorems and Expansions: Rolle's Theorem, Mean Value Theorem, Taylor's Theorem, and Maclaurian's Theorem.	04	**CLO2**
Section-B (SEE: 50 Marks) Group: A (20 Marks)			
4	Partial Differentiation, Euler's formula, Maxima and minima	04	**CLO2**
5	Indefinite integral: Physical meaning of integration of a function, method of Substitution, Integration by parts, special trigonometric functions and rational and partial fractions, different techniques of integration	06	**CLO2**
Group: B (30 Marks)			
6	Definite integral: Fundamental theorem, general properties, and evaluations of definite integral and reduction formula, definite integral as the limit of a sum, Integration by method of successive reduction, Gamma and Beta Function.	07	**CLO2**
7	Multiple Integrals: Jacobian Theorem, Double Integral, Change of order of integration, Triple Integral, Physical application of double and triple integral, Quadrature, Determination of the length of curves, Finding an area of a region.	07	**CLO2**
8	Integration by Revolution: Arc length of a curve, Areas of surfaces of revolution, Volumes of solids of revolution, Solving real world problems through calculus	03	**CLO3**
		45	

Text Books:

SL NO.	Name of Authors	Title of the Books	Edition	Publisher's Name	Year
1	P. K. Bhattacharjee	A Text Book on Differential Calculus	First Flat	Gonith Prokashon	2006
2	Abu Yusuf	Differential Calculus	Revised Reprinted	Mamun Brothers	2007
3	P. K. Bhattacharjee	A Text Book on Integral Calculus	First 2nd	Gonith Prokashon	2007
4	K.A. Stroud	Engineering Mathematics	7th	Palgrave Macmillan	2013

Reference Books:

SL NO.	Name of Authors	Title of Book	Edition	Publisher's Name	Year
1	Erwin Kreysig	Advanced Engineering Mathematics	10th	John Wiley & Sons Inc.	2011
2	Thomas, Finey	Calculus and Analytic Geometry	9th	Addison Wesley	1995
3	Earl W. Swokowski	Calculus with Analytic Geometry	2nd	Prindle	1984

Course Assessment Pattern (Theory courses):

Bloom's Category		Evaluations out of 100 marks			
		CIE (50 marks)			SEE (50marks)
Cognitive learning	Affective learning	Mid-term (30)	Assignment/ Class Test (10)	Attendance Marks (10)	Written Exam (50)
Remember	-	5	-	-	5
Understand	-	25	5	-	35
Apply	-	-	5	-	10
Analyze	-	-	-	-	-
Evaluation	-	-	-	-	-
Create	-	-	-	-	-
X	Responding	x	x	10	-

Note: **CIE**= Continuous Internal Evaluation, **SEE**= Semester End Examination