Marwadi University

Syllabus for Diploma Engineering

All Branch

Semester – III

Subject Name: Basic Calculus

Subject Code: 09MA1301

Diploma Branches in which this subject is offered: All Branch

Objective: Students are intended to understand the basic concepts of calculus such as Limit of Functions, Differentiation and Integration. The knowledge of calculus can help to understand and solve problems related to Engineering fields. The course will help students to understand Engineering principles and concepts. Main objective of the course is to apply concepts of Limit of Functions, Differentiation and Integration to solve given engineering problems.

Credits Earned: 3 Credits

Course Outcomes: After completion of this course, student will be able to

- Can solve algorithms through Functions.
- Verify the value of limit of the function at point using definition of limit.
- Show whether a function is differentiable at a point.
- Identify the increases and decreases functions using differentiation.
- Compute the expression for the line tangent to a function at a point.
- Compute derivatives of exponential, trigonometric, polynomial and rational functions
- Evaluate the integrations of exponential, trigonometric, polynomial and rational functions.
- Interpret differentiation and integrations as inverse operations.

Pre-requisite of course: NA.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term work	
2	2	0	3	50	30	20	25	25	150

Contents

Unit	Topics	Lab Hours	Lecture Hours
1	**Limit of Functions** 1) Introduction 2) Real Function 3) Operations on Real Function 4) Definition and some properties of limits 5) Limit of polynomial and rational functions 6) Limit of trigonometric function 7) Limit of exponential function 8) Limit at infinity	**8**	**7**
2	**Differentiation** 1) Definition 2) Some properties 3) Derivative of some important function 4) Chain rule 5) Derivative of implicit function 6) Derivative of parametric function 7) Logarithmic differentiation 8) Second order Derivative	**10**	**10**
3	**Integration** 1) Definition and concept 2) Some special integrals 3) Integration by substitution method 4) Integration by parts 5) Some special types of integrals	**6**	**7**
Total		**24**	**24**

List of Tutorials:

	LAB HOURS
Limit of Functions	
1) Real Function	**2**
2) Limit of polynomial and rational functions	**2**
3) Limit of trigonometric function and exponential function	**2**
4) Limit at infinity	**2**
Differentiation	
1) Some properties and Derivative of some important function	**2**
2) Chain rule	**2**
3) Derivative of implicit function and parametric function	**2**
4) Logarithmic differentiation	**2**
5) Second order Derivative	**2**
Integration	
1) Some special integrals	**2**
2) Integration by substitution method	**2**
3) Integration by parts and Some special types of integrals	**2**
TOTAL	**24**

References Links:

1. https://brilliant.org/wiki/limits-of-functions/
2. https://www.intmath.com/differentiation/differentiation-intro.php
3. https://www.khanacademy.org/math/calculus-home/integration-calc

Suggested Theory distribution:

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
30%	30%	30%	10%	---	---

Instructional Method:

a. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, Quiz, brainstorming.

b. The internal evaluation will be done on the basis of continuous evaluation of students in the class-rooms