

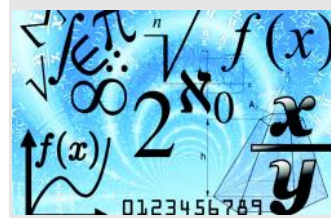
19HS102**ENGINEERING MATHEMATICS I (B)**
BASIC MATHEMATICS

Hours Per Week :

L	T	P	C
3	1	2	5

Total Hours :

L	T	P	WARA	SSH/HS	CS	SA	S	BS
45	15	30	20	45	-	10	-	5

Source: <https://www.google.co.in/>**COURSE DESCRIPTION AND OBJECTIVES:**

To acquaint students with fundamental principles of mathematics through partial fractions, induction, calculus, numerical methods that serves as an essential tool in several engineering applications.

COURSE OUTCOMES:

Upon completion of the course, the student will be able to achieve the following outcomes:

COs	Course Outcomes	POs
1	Demonstrate the technique of numerical methods to solve integrals.	1, 2
2	Apply the methods of differentiation and integration for functions.	1, 2
3	Resolve algebraic expressions into partial fractions and to prove the identities by mathematical induction.	1, 2
4	Analyse the continuity and differentiability of functions.	1, 2
5	Use software tools to obtain and verify the solutions.	5

SKILLS:

- ✓ Prove empirical mathematical relations using mathematical induction.
- ✓ Resolve given fractional polynomials into partial fractions.
- ✓ Test the functions of one variable for their continuity and differentiability.
- ✓ Apply numerical methods for integrating functions and finding roots of algebraic equations.

ACTIVITIES:

- o Find continuity, differentiability and the limit of a given function.
- o Find appropriate value of integrals using trapezoidal, Simpson's rules.
- o Find an appropriate root for a given function using Newton - Raphson method.

UNIT - I**L-9****MATHEMATICAL PRELIMANIRIES:**

Partial fractions : Introduction, proper and improper fractions, Resolution into partial fractions : type 1, type 2, type 3, type 4.

Mathematical Induction : Introduction, Principles of Mathematical induction.

UNIT - II**L-9**

TRIGONOMETRY : Introduction, Trigonometric functions, properties, Compound angles.

UNIT - III**L-9**

DIFFERENTIAL CALCULUS : Introduction, Limits, Continuity, Differentiation, Methods to compute derivatives; Partial Differentiation.

UNIT - IV**L-9**

INTEGRAL CALCULUS : Introduction, Integration, Methods to compute integrals, Definite Integration.

UNIT - V**L-9****NUMERICAL METHODS – I**

NUMERICAL INTEGRATION : Trapezoidal rule, Simpson's 1/3 rule, Simpsons 3/8 rule.

Solutions of Algebraic and Transcendental Equations : Introduction, Bisection method, Iteration method, Newton-Raphson method.

LABORATORY EXPERIMENTS**LIST OF EXPERIMENTS****TOTAL HOURS: 30**

Students are expected to do atleast ten of the following experiments.

1. Mathematical Preliminaries.
2. Partial fractions for fractional polynomial.
3. Limits of functions.
4. Continuity of functions.
5. Differentiation of functions of one or two variables.
6. Integration of functions.
7. Definite integrals of functions.
8. Trapezoidal Rule for numerical integration of functions.
9. Simpson's 1/3 Rule for numerical integration of functions.
10. Simpson's 3/8 Rule for numerical integration of functions.
11. Newton-Raphson method.

TEXT BOOKS:

1. C. W. Evans, "Engineering Mathematics - A Programmed Approach", Special Indian Edition, Stanley Thornes (Publishers) Ltd., Cheltenham, UK, 2011.

REFERENCE BOOKS:

1. P. Seshagiri Rao, "A Textbook of Remedial Mathematics", 2nd edition, Pharma Med Press, 2015.
2. A. Jeffrey, "Mathematics for Engineers and Scientists", 6th edition, (Special Indian Edition), CRC Press, 2013.