

(Applicable to the batch of students admitted in the academic year 2025-2026)

B.Sc..(Mathematics) (CBCS)

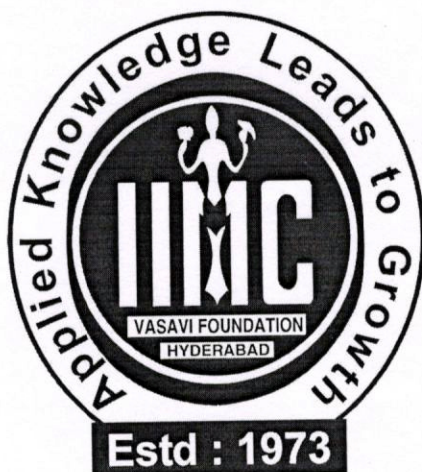
FACULTY OF SCIENCE, IIMC

B.Sc.(MATHEMATICS)

Syllabus (CBCS)

(w.e.f. 2025-26)

Semester I -VI



FACULTY OF SCIENCE
Department of Mathematics
INDIAN INSTITUTE OF
MANAGEMENT & COMMERCE
Autonomous College (UG & PG)

6-1-91, Khairatabad, Hyd- 500 004, T.S

R. f.

Chairman
Board of Studies
Dept. of Mathematics

D. Rao

Dean (Academic)
Indian Institute of Management and Commerce
6-1-91, Khairatabad, Hyderabad-500 004.

D. H.

PRINCIPAL
Indian Institute of
Management & Commerce

B. Sc. (Mathematics) Course Structure

with effect from the academic year 2025-2026

Sem	Paper	Subject	Hours/ per week		Credits	Marks (IA)	Marks (ESE)	Total Marks
			Theory	Tutorials*				
I	DSC 1	Differential Equations	4	1	5	30	70	100
II	DSC 2	Real Analysis	4	1	5	30	70	100
III	DSC 3	Differential & Vector Calculus	4	1	5	30	70	100
IV	DSC 4	Algebra	4	1	5	30	70	100
V	DSC 5	Linear Algebra	4	1	5	30	70	100
V	Multi - Disciplinary (MDC)	(A) Mathematics of Finance & Insurance OR	4	-	4	30	70	100
		(B) Basic Mathematics						
VI	DSE	(A) Numerical Analysis OR	4	1	5	30	70	100
		(B) Integral Transforms OR						
		(C) Analytical Solid Geometry						
VI	SEC-IV	(A) Number Theory OR	2	-	2	10	40	50
		(B) Verbal Reasoning OR						
		(B) Quantitative Aptitude						
VI	Project/ Internship		4	-	4			100

*Tutorials: Problems solving session for each 20 student's in one batch.

IA - Internal Assessment

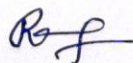
ESE - End Semester Examination

DSC - Discipline Specific Course

DSE - Discipline Specific Elective

SEC - Skill Enhancement Course

MDC - Multi Disciplinary Course



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SEMESTER- I
DIFFERENTIAL EQUATIONS

Theory: 4 hours per week and **Tutorials:** 1 hour per week

DSC-I

Objectives: Introduce the fundamental concepts and methods of solving first-order and higher-order differential equations. Provide an understanding of the role of integrating factors, substitutions, and transformations in solving exact and reducible equations. Introduce higher-order linear differential equations, their solutions using operator methods, undetermined coefficients, and variation of parameters.

Outcomes: Solve first-order and first-degree differential equations using separable, homogeneous, linear, exact, and reducible forms. Apply the concepts of integrating factors and transformations to simplify and solve differential equations. Solve higher-order linear differential equations with constant coefficients, both homogeneous and non-homogeneous, using operator methods and the method of undetermined coefficients.

UNIT- I

Differential Equations of first order and first degree: Introduction- Equations in which Variables are Separable – Homogeneous Differential Equations - Differential Equations Reducible to Homogeneous Form – Linear Differential Equations - Differential Equations Reducible to Linear Form – Exact Differential Equations – Integrating Factors – Change in Variables. (Sec. 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9)

UNIT- II

Differential Equations of first order but not of first degree: Equations solvable for p – Equations solvable for y – Equations solvable for x – Equations that do not contain x (or y) – Equations Homogeneous in x and y – Equations of First Degree in x and y – Clairaut's equation.

Applications of first order Differential Equations: Growth and Decay – Dynamics of Tumor Growth – Radioactivity and Carbon Dating – Compound Interest – Orthogonal Trajectories. (Sec. 3.1, 3.2, 4.1, 4.2, 4.3, 4.4, 4.20)

UNIT- III

Higher order Linear Differential Equations: Solution of Homogeneous Linear Differential Equations with constant coefficients - Solution of Non-Homogeneous Differential Equations $P(D)y = Q(x)$ with constant coefficients by means of polynomial operators when $Q(x) = be^{ax} / \sqrt{e^{ax}} / b \cos(ax) / b \sin(ax) / b x^k$, Method of undetermined coefficients. (Sec. 5.1, 5.2, 5.3, 5.4)

UNIT- IV

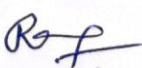
Method of variation of parameters – Linear Differential Equations with non-constant coefficients – The Cauchy – Euler Equation – Legendre's Linear Equations – Miscellaneous Differential Equations – Total Differential Equations – Simultaneous Total Differential Equations – Equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$. (Sec. 5.5, 5.6, 5.7, 5.8, 5.9 and Sec. 2.10, 2.11, 2.12)


TEXT BOOK:

1. Zafar Ahsan — *Differential Equations and Their Applications*, PHI Learning Pvt. Ltd., Third Edition, 2016.

REFERENCE BOOKS :


1. Frank Ayres Jr — *Theory and Problems of Differential Equations*: Schaum Publishing Co. (McGraw-Hill), 1952.
2. L. R. Ford — *Differential Equations*: McGraw-Hill, Second Edition, 1955
3. Daniel Murray — *Differential Equations*.
4. S. Balachandra Rao — *Differential Equations with Applications and Programs*: Sangam Books, illustrated edition, 1996.
5. Stuart P. Hastings & J. Bryce McLeod — *Classical Methods in Ordinary Differential Equations*.


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