



**Kadi Sarva Vishwavidyalaya**  
**Faculty of Engineering & Technology**  
**First Year Bachelor of Engineering (All Branches)**  
(With effect from: Academic Year 2017-18)

<b>Subject Code: CC101-N</b>	<b>Subject Title : ENGINEERING MATHEMATICS – I</b>
<b>Pre-requisite</b>	-

**Course Objective:**

- To present the foundations of many basic Mathematical tools and concepts related Engineering.
- To provide a coherent development to the students for the courses of various branches of Engineering like Control Theory , Circuits and Networks, Digital Logic design ,Fluid Mechanics, Machine Design etc
- To enhance the student's ability to think logically and mathematically.
- To give an experience in the implementation of Mathematical concepts which are applied in various field of Engineering.

Teaching scheme				Total Credit	Evaluation Scheme					Total Marks
L	T	P	Total		Theory		Mid Sem Exam Marks	CIA Marks	Pract. Marks	
Hrs	Hrs	Hrs	Hrs		Hrs	Marks				
04	01	00	05	05	03	70	30	50	00	150

**Outline of the Course:**

Unit No	Topics
1	Differential Calculus
2	Partial differentiation and its applications
3	Curve Tracing
4	Beta And Gamma Function
5	Integral Calculus
6	Multiple Integrals and its applications
7	Infinite Series

**Total hours (Theory): 64**

**Total hours (Tutorial): 16**

**Total hours: 80**



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**Detailed Syllabus**

Unit No	Topics	Lectures (Hours)	Weight age
1	<b>Differential Calculus:</b> Review of limit, continuity, differentiability, Sandwich theorem. Indeterminate forms, Taylor's & Maclaurin's expansions.	5	10%
2	<b>Partial differentiation and its applications:</b> Limit and Continuity for the several variables, Definition of partial derivatives, homogeneous function, Euler's theorem, Chain rule, Partial and total differential coefficient, partial differentiation of composite function and implicit function, <b>Applications:</b> Tangent plane and Normal line, Jacobians, Taylors expansion for two variables, Errors and approximations, Maxima and Minima of functions of two variables, Lagrange method of undetermined multipliers to determine stationary values	15	25%
3	<b>Curve Tracing:</b> Curve Tracing for Cartesian and Polar coordinates.	6	10%
4	<b>Beta &amp; Gamma function:</b> Introduction, Reduction formulae of the type $\int \sin^n x dx$ , $\int \cos^n x dx$ & $\int \sin^n x \cos^m x dx$ using beta and gamma function	5	5%
5	<b>Integral Calculus :</b> Application of single integration - Area of a bounded region, volume & surface area of a solid of revolution for Cartesian, polar form.	6	5%
6	<b>Multiple Integrals and its applications:</b> Double integral, Change of Order, Polar form, Transformation of Variables by Jacobian, Triple Integral, Area, Volume.	14	25%
7	<b>Infinite Series:</b> Limit of Sequence, Definition of Infinite Series, Convergence and divergence, Comparison test, Cauchy's integral test, ratio test, Cauchy's Root test, Raabe's test, Gauss test, Leibnitz rule for alternating series, power series, radius of convergence.	13	20%
<b>Total</b>		64	100%

**Instructional Method and Pedagogy:**

- Two Faculties will be covering the syllabus in each branch for 5 hours in a week. In Tutorial, class must be divided into two subclasses & faculties will be solving or assigning the problem of the subject in each subclass.
- Attendance is compulsory in lectures and Tutorial which carries 05 Marks.
- At regular intervals assignments is given. In all, a student should submit all assignments of 30 marks each.
- Classroom participation and involvement in solving the problems in Tutorial rooms carries 05 Marks.
- Viva Voce will be conducted at the end of the semester of 10 Marks.
- One internal exam of 30 marks is conducted as a part of internal theory evaluation.



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**Learning Outcome:**

Upon graduation, students will have:

- The students will be able to think logically and mathematically in any field of engineering.
- The students will gain an experience in the implementation of Mathematical concepts which are applied in various field of Engineering

**REFERENCE BOOKS/TEXT BOOK:**

1. **Thomas Calculus** by M D Weir, Joel Hass and F R Giordano, 11<sup>th</sup> Edition, Pearson Education..
2. **Calculus** by G. B. Thomas and R. L. Finney, 9<sup>th</sup> Edition, Pearson Education.
3. **Advance Engineering Mathematics** by Erwin Kreyszig, 8<sup>th</sup> edition, Wiley India.
4. **Engineering Mathematics** by Sahani, Vol. 8, Elite Publication, Pune.
5. **Calculus** by T M apostol, Vol. I, 2<sup>nd</sup> Edition, Willey India.
6. **Single and Multivariable Calculus** by Hughes-Hallett, Gleason, Mccallum, 3<sup>rd</sup> Edition, John Willey and Son.

**List of Tutorials**

Sr. No.	Tutorial Content
1	Problem solving on " <b>Review of Calculus</b> ".
2	Problem solving on " <b>Partial differentiation and its applications</b> ".
3	Assignment on " <b>Curve Tracing</b> ".
4	Assignment on " <b>Beta and Gamma Function</b> ".
5	Problem solving on " <b>Integral Calculus</b> "
6	Assignment on " <b>Multiple Integrals and its applications</b> ".
7	Problem solving on " <b>Infinite Series</b> "