16BSM201–Calculus and Analytical Geometry										
Teaching Scheme					**Examination Scheme**					
L	**T**	**P**	**C**	**Hrs/Week**	**Theory**			**Practical**		**TotalMarks**
					MS	**ES**	**IA**	**LW**	**LE/Viva**	
3	**--**	**--**	**3**	**3**	**25**	**50**	**25**	**--**	**--**	**100**

OBJECTIVES

(1) To familiarize integration concept, familiarize integration formulas and to countercheck anti-differentiation by its inverse problem in Sciences.
(2) To familiarize different integration techniques.
(3) To tackle several integration applications with deep concentration to engineering.
(4) To familiarize the concept of parameterization, and introduce the students to polar coordinates, also to get an overview of conic section in polar coordinates.

SYLLABUS

UNIT	**10**

Indefinite Integral, The definite integral as the limit of Riemann sum, properties of definite Integrals, The fundamental theorem of calculus (with proof), Substitution in definite integrals.

UNIT II	**10**

Basic Integration formulas, integration by parts, partial fractions, trigonometric substitutions, improper integrals.

UNIT III	**10**

Area between curves, volumes of solids of revolution, length of an arc, moments and centers of mass, work, fluid pressure and forces, probability

UNIT IV	**9**

Parameterization of plane curves, calculus with parameterized curves, polar coordinates, conic section, polar equations for conic section, integration in polar coordinates.

APPROXIMATE TOTAL	**39 Hours**

OUTCOMES

1. Students obtain the insight of definite integral and get a thorough idea of a landmark theorem in calculus, which is “Fundamental theorem of calculus”.
2. Students gain the knowledge of dealing with several techniques of integration, and also about the improper integral concept.

3. Students should get idea about the potential applications of integrals in several fields of science and engineering.
4. Students will get an idea of dealing with the integral calculus problems in parametric as well as polar curves.

TEXTS AND REFERENCES

1. H. Anton, I. Bivens, S. Davis, Calculus: Early Transcendentals, tenth edition, John Wiley and Sons.
2. George B. Thomas and Ross L. Finney, Calculus and Analytic Geometry, 9th Edition, Peaerson.
3. E. Mendelson, Beginning Calculus, Third Edition, Schaum's Series.