Objectives:

1. To familiarize integration of several variable concept, familiarize integration formulas and to countercheck anti-differentiation by its inverse problem sciences.

2. To familiarize different integration techniques

3. To tackle several integration applications with deep concentration to engineering.

4. To familiarize iterated integration as plane area and as volume and to analyze volume in general regions.
5. To acquaint the students about the applications of various concepts of Mathematics mentioned in the syllabus.

BSM 301 CALCULUS OF SEVERAL VARIABLES - II										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs./Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
4	0	0	4	4	25	50	25	---	---	100

Unit-I [9]

PREREQUISITES

A course in one variable calculus

Functions of several variables and examples; continuity; concept of distances in higher dimension; examples; how to define differentiable functions.

Unit-II [10]

Directional derivatives as direct generalization from one variable; drawbacks; definition of differentiable functions of several variable; examples; matrix of a linear transformation; Jacobian matrix; recovering directional derivative from derivative; chain rule.

Unit-III [10]

Comparison with one variable calculus: higher derivatives and Taylor's formula; Sufficient condition for equality of mixed derivatives; extremas for real valued function and special case for functions with two variables. Triple integrations

Unit-IV [10]

Statement of Implicit Function Theorem and Inverse Function Theorem.Divergence and curl. Identities forgrad, div and curl. Green's, Stokes's and Gauss's theorems.Lagrange's Multipliers.

APPROXIMATE TOTAL

Texts and References

1. Principles of Mathematical Analysis, W. Rudin
2. Calculus ? T. Apostol
3. Mathematical Analysis, T. Apostol

Course Outcomes:

1. Students obtain the skills necessary to deal with models in engineering and science involving *differential calculus of several variable*.
2. Students gain a familiarity with the *elementary special functions* (e.g. exponential, log, and trigonometric functions) which arise in engineering and science.
3. Students gain a familiarity with the application of function of several variable which arise in engineering and science.
4. Students learn the basic calculus and analytic geometry concepts in order to understand the development of many models in engineering and science.