

MANIPAL UNIVERSITY JAIPUR

School of Basic Sciences

Department of Mathematics & Statistics

Course Hand-out

Calculus II | MA 1203 | 4 Credits | 3 1 0 4

Session: Jan. -June 2018 | Faculty: Dr. Kalpna Sharma | Class: B.Sc (Hons) Mathematics

COURSE OUTCOMES: At the end of the course, students will be able to

[1203.1] Describe the concepts of Partial Differentiation and apply their concepts to evaluate the solutions of related problems.

[1203.2] Evaluate the series expansion of functions due to Taylor's and Maclaurin's.

[1203.3] Apply the concepts of integral calculus in rectification and solid of revolution problems which will enhance the analytical skill to become employable in the relevant field.

[1203.4] Describe the concept of Beta and Gamma Functions and their applications to evaluate integrals.

[1203.5] Describe the concept of multiple integrals and their application in Surface area and Volume evaluation which will enhance the analytical skill to become employable in the relevant field.

A. SYLLABUS

Partial differentiation: First and higher order derivatives; Differentiation of homogeneous functions; Euler's theorem; Total derivative and differential; Differentiation of implicit functions and composite functions. **Taylor's theorem:** Taylor's theorem for functions of two variables; Maclaurin's expansion in power series; Jacobian, evaluation of Jacobian. **Maxima & minima:** Maxima-minima for functions of two variables; Necessary and sufficient condition for extreme points. **Integral calculus:** Recapitulation of methods of integration and definite integral; Reduction formulae; Application of integral calculus; Length of arcs; Surface areas and volumes of solids of revolutions for standard curves in Cartesian and polar forms. **Beta and Gamma functions:** Beta and Gamma functions and relation between them; Evaluation of integrals using Beta and Gamma functions. **Multiple integrals:** Double and triple integration of bounded functions on bounded domain; Change of order of double integration; Area and Volume; Change of variables.

B. TEXT BOOKS

1. Shanti Narayan and P. K. Mittal, Differential Calculus, S. Chand & Company Ltd., New Delhi, 2011
2. Shanti Narayan, Integral Calculus, S. Chand and Company Ltd., New Delhi, 2004.
3. S. Narayanan & T. K. Manicavachagom Pillay, Calculus I & II, S. Viswanathan Pvt. Ltd., Chennai, 2010.
4. N. P. Bali, Differential Calculus, Laxmi Publications (P) Ltd., New Delhi, India, 2010.

