CLUSTER UNIVERSITY SRINAGAR

SYLLABUS (FYUP UNDER NEP 2020)

Offered By Department Of MATHEMATICS

Semester 2nd (Major Course)

Course Title: Calculus-II

Course Code: UGMTH22J201 | **Max. Marks 100**
Credits: 4 (Theory: 3, Tutorial: 1) | **External: 75; Min Marks: 30**
Contact Hrs: 60 | **Internal (Continuous Assessment): 25 Marks, Min Marks: 10**

Course Objectives/ Outcomes

After the completion of this course, the students shall be able to:

- Solve integrals of irrational functions
- Solve integrals of trigonometric functions with positive integer powers using Reduction formula.
- Find volumes and surface areas of solids generated by revolving plane regions about axes.
- Solve ordinary differential equations of different types.

UNIT – I **(15 Hrs)**

Integration of irrational functions, Reduction formulae: $\int \sin^n x\,dx$, $\int \cos^n x\,dx$, $\int \tan^n x\,dx$, $\int \sec^n x\,dx$, $\int \operatorname{cosec}^n x\,dx$, $\int \sin^n x \cos^m x\,dx$, $\int x^m \cos nx\,dx$. Definite integrals and its properties, Fundamental theorem of calculus (statement only). Examples and exercises based on these topics.

UNIT – II **(15 Hrs)**

Applications of integration**:** Area between curves**,** volumes of solids of revolution along x-axis and y-axis, volumes of cylindrical shells, arc length, area of surface of revolution. Examples and simpleexercises on these topics.

UNIT – III **(15 Hrs)**

Linear differential equations of first order, Bernoulli's differential equation, exact differential equations, necessary and sufficient conditions for exactness, differential equations reducible to exactform, symbolic operators, linear differential equations with constant coefficients. Homogeneous linear equations. Application of first order differential equations to acceleration-velocity model, Growth and decay model.

UNIT – IV **(15 Hrs)**

Differential equations of first order but not of first degree, Equations solvable for x, y and p, secondand higher order differential equations from which one variable is explicitly absent, Clairut's form, equations reducible to Clairut's form**.** Problem on miscellaneous methods of first order but higher degree and second or higher order differential equations.

Recommended Books:

1. Calculus Early Transcendentals by James Stewart, Cengage.
2. Calculus and Analytic Geometry by George B. Thomas and Ross L Finney, Pearson.
3. Differential equations by H.T.H Piaggio, CBS publishers.
4. Differential Equations with Applications and Historical Notes by GF Simmons, McGrawHill Education.
5. Integral Calculus by S.D. Chopra and M.L. Kochar, Kapoor publication.