GONDWANA UNIVERSITY, GADCHIROLI.

B.SC. II (MATHEMATICS)
SEMESTER WISE SYLLABUS
WITH EFFECT FROM
2013-14
Teaching Pattern

B.Sc. Part II
Semester III:

Paper I : **MAT 201 : Advanced Calculus and Group Theory**

Paper II : **MAT 202 : Differential Equations**

Semester IV :

Paper III : **MAT 203 : Abstract Algebra & Differential Equation**

Paper IV : **MAT 204 : Classical Mechanics & Statics**

Teaching Pattern:

1. Four Lectures per week per paper.

2 One tutorial per week per batch per paper. (The batches of tutorials to be formed as prescribed by the University).

SYLLABUS

B. Sc. II (Semester – III)

Paper – I

MAT 201 : Advanced Calculus and Group Theory

Total Marks : 75 (60+15)

UNIT – I

Group : Definition of Group with example and Properties, Sub-group, cosets ,Normal Subgroup.

UNIT - II

Permutation groups, product of permutations, even and odd permutation. Cyclic group. Group homorphism and isomorphism. Fundamental theorem of homomorphism.

UNIT III

Limit and continuity of function of two variables Partial differentiation, chain rule, Differential.

UNIT – IV

Jacobins, Homogeneous function, and Euler's theorem, maxima & minima and saddle point of function of two variables, Lagrange's multiplier method.

Reference Books :-

1. Prof. T. M. Karade and M. S. Bendre, Advanced Calculus, Sonu Nilu, Bandu Soni Layout, Gayatri road, Parsodi, Nagpur.
2. George J. Klir and B.O. Yuana, Fuzzy set and Fuzzy Logic, Prentice Hall India Ltd. 2002.
3. Gabriel Klambauel, Mathematical Analysis, Marcel Dekkar, Inc. New York, 1975.
4. T. M. Apostol, Matheematical Analysis, Narosa Publishing House. New Delhi, 1985.
5. R. R. Goldberg, Real Analysis. Oxford & I. B. H. Publishing Co., New Delhi 1970.
6. D. Soma Sundaran and B. Choudhary. A first course in Mathematical Analysis, Narosa Publishing House. New Delhi, 1977.

7. P. K. Jain and S. K. Kaushik, An Introduction to Real Analysis, S. Chand & Co. New Delhi, 2000.
8. Gorakh Prasad, Differential Calculus, Pothishala Pvt. Ltd., Allahabad.
9. Murray R. Speigel, Theory and Problems of Advanced Calculus, Schaum Publishing Co., New York.
10. Gorakh Prasad, Integral Calculus, Pothishala Pvt. Ltd., Allahabad.
11. S. C. Malik, Mathematical Analysis, Wiley Eastern Ltd., New Delhi.
12. I. N. Herstein, Topics in Algebra, Wiley eastern, Ltd. New Delhi, 1975.
13. P. B. Battacharya, S. K. Jain and S. R. Nagpaul, First Course in Linear Algebra, Wiley eastern, Ltd. New Delhi, 1983.
14. N. Piskunov, Differential and Integral Calculus, Peace Publishers, Moscow.
15. Shanti Narayan, A Course of Mathematical Analysis S. Chand & Co., New Delhi.

SYLLABUS

B. Sc. II (Semester –III)

Paper – II

MAT 202 : Differential Equations

Total Marks : 75 (60+15)

UNIT I

Method of solution of dx/P = dy/Q = dz/R, Pfaffian differential equation, Formation of partial Differential equation, Lagrange's equations, Linear Partial Differential equation, Charpit's Method, Compatible Differential Equation.

UNIT – II

Linear partial Differential equation of second & higher order, Homogenous & non – homogeneous equation with constant coefficients, Equation reducible of linear PDEs with constant coefficients.

UNIT – III

Laplace transforms, Existence theorem for Laplace transforms, Linearity of Laplace transform, Shifting theorem, Inverse Laplace transform.

UNIT – IV

Convolution theorem, Laplace transform of derivatives & integrals, Differentiation & integration of transform, Solution of differential equation,Partial differential equation.

Reference Books :-

1. Prof. T. M. Karade, Differential Equations, Sonu Nilu, Bandu Soni Layout, Gayatri road, Parsodi, Nagpur.
2. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley and Sons Inc. 1999.
3. D. A. Murray. Introductory Course on Differential Equations, Orient Longman. (India). 1967.
4. A. R. Forsyth. A Treatise on Differential Equations. Macmillan and Co. Ltd. London.
5. Francis B. Helderbrand, Advance Calculus for Applications, Prentice Hall of India Pvt. Ltd., New Delhi, 1977.
6. Jane Cronin. Differential Equations. Marcel Dekkar, Inc. New York, 1994.
7. Frank Ayres. Theory and Problems of Differential Equations. McGraw-Hill Book Company. 1998.
8. Richard Bronson. Theory and Problems of Differential Equations. McGraw-Hill. Inc. 1973.