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 - IV)

Paper – III
MAT 203 : Abstract Algebra & Differential Equation
Total Marks : 75 (60+15)

UNIT – I
Group automorphism, Inner Automorphism, Automorphism Group & their computations. Cayley’s theorem, Counting principle.

UNIT – II
Ring theory, Subrings, Integral domain, Characteristic of rings, Ideals.

UNIT – III
Introduction of power series, Legendre’s Equations, Legendre’s polynomial, generating function of Pn(x). Recurrence formula for Pn (x), Orthogonality of Legendre’s polynomials, Bessel’s equation, Recurrence formula for Jn (x).

UNIT – IV
Fourier series, Even and odd periodic function, orthogonal function, Dirichlet Condition, Half range Fourier sine & cosine series.
Reference Books :-

SYLLABUS
B. Sc. II (Semester - IV)

Paper IV

MAT 204 : Classical Mechanics & Statics

Total Marks : 75 (60+15)

UNIT – I
Analytical condition of equilibrium of coplanar forces, Virtual work, Uniform
catenary.

UNIT – II
Generalized co-ordinates, Constraints, D’ Alembert’s Principle & Lagrange’s
equations.

UNIT – III
Reduction to the equivalent one body problem, Central force field, Classification of
central orbit, Differential equation of central orbit, Kepler’s laws of motion, Virial
theorem.

UNIT – IV
Hamilton’s Principle, Extension of Hamilton’s principle to non conservative
holonomic system, Hamilton’s equation. Principle of least action, Routhian, Routh’s
Procedure.

Reference Books :-
1. Prof. T. M. Karade, Classical Mechanics, Sonu Nilu, Bandu Soni Layout, Gayatri road.
Parsodi, Nagpur.
2. Prof. T. M. Karade and M. S. Bendre, Mechanics, Sonu Nilu, Bandu Soni Layout, Gayatri
road, Parsodi, Nagpur.
5. R. S. Verma, A Text Book on Statics, Pothishala Pvt. Ltd., Allahabad
6. S. L. Loney, An Elementary Treatise on the Dynamics of a Particle and of Rigid bodies,