GONDWANA UNIVERSITY
GADCHIROLI

SEMESTER SYSTEM PATTERN SYLLABUS

for

B.Sc.
Mathematics

SEMESTER – V

(With effect from : 2014-15)
SYLLABUS

B. Sc. III (Semester – V)

Paper – I (Compulsory)

MAT 301 : Linear Algebra

Total Marks : 75 (60+15)

UNIT – I

Analytic function, Cauchy Riemann equation, Polar form of C – R equations,
Harmonic function, Mobius transformation, Cross ratio.

UNIT – II

Vector space, Subspace, Linear span, Quotient space, Linear dependence and
independence and their basic properties, Basis and dimension.

UNIT – III

Linear transformations : The algebra of linear transformation, Rank-Nullity theorem,
Matrix and linear transformation, Rank and Nullity of a matrix, Isomorphism.

UNIT – IV

Inner product space: Inner product, Cauchy Schwartz inequality, Orthogonal vectors,
Orthogonal complement, Orthonormal set. Bessel’s inequality for finite dimensional
space, Gram – Schmidt orthogonalisation process.
Reference Books :-

SYLLABUS
B. Sc. III (Semester – V)

Paper – II (Optional)
MAT 302 : Special Relativity - I

Total Marks : 75 (60+15)

UNIT – I

UNIT – II
Einstein’s special theory of relativity, postulates of special relativity theory, Lorentz transformation, Geometrical interpretation of Lorentz transformation, Group properties of Lorentz transformation, Length contraction, Time dilation.

UNIT – III
Relativistic Kinematics – Composition of parallel velocities, Transformation equations for components of velocity, Relativistic addition law for velocities, transformation of Lorentz contraction factor \( (1-v^2/c^2)^{1/2} \), The transformation equation for components of acceleration of a particle.

UNIT – IV
Geometrical representation of space time, Four dimensional Minkowskian space time of special relativity, Time like, Light-like and space-like intervals, Lorentz transformation in index form, proper time, world line of a particle, Four vectors and Four tensor in Minkowskian space-time.

Reference Books :-
1. Lectures on Special Relativity
   Prof. T. M. Karade, K. S. Adhav and Maya S. Bendre, Sonu Nilu.
SYLLABUS

B. Sc. III (Semester – V)

Paper – III (Optional)

MAT 303 : Linear Programming and Transportation Problem

Total Marks : 75 (60+15)

UNIT – I


UNIT – II


UNIT – III

Transportation Problems
Mathematical formulation of Transportation problem, Tabular representation, Definitions, Special structure of the solution, North-west corner rule, Vogel’s approximation method, Method of finding optimal solution, algorithm for solving transportation problem

UNIT – IV

