GONDWANA UNIVERSITY
GADCHIROLI

SEMESTER SYSTEM PATTERN SYLLABUS

for

B.Sc.
Mathematics

SEMESTER – V I

(With effect from : 2014-15)
SYLLABUS

B. Sc. III (Semester – VI)

Paper – IV (Compulsary)

MAT 304 : Analysis

Total Marks : 75 (60+15)

UNIT – I

Metric space, subspace of metric space, open set, Cauchy’s sequence, complete Metric space, compactness.

UNIT – II

Riemann Integral, Integrability of continuous and monotonic function,
The Fundamental theorem of integral calculus, Mean value theorem of integral calculus.

UNIT – III

Complex integration, Cauchy’s integral theorem, Cauchy integral formula, singularity,
Residue theorem.

UNIT – IV

Fourier Transform:-

Reference Books :-

1. Prof. T. M. Karade, J. N. Salunke, K. S. Adhav and M. S. Bendre, Analysis, Sonu Nilu,
   Bandu Soni Layout, Gayatri road, Parsodi, Nagpur.
2. Prof. T. M. Karade, Complex Analysis, Sonu Nilu, Bandu Soni Layout, Gayatri road,
   Parsodi, Nagpur.
SYLLABUS

B. Sc. III (Semester – VI)

Paper – V (Optional)

MAT 305 : Special Relativity - II

Total Marks : 75 (60+15)

UNIT – I

Tensor Analysis - Coordinate transformations, Summation Convention, The Kronecker delta, Covariant, Contravariant and mixed tensor, symmetric and skew symmetric tensors, Fundamental operations on tensors, metric tensor, conjugate metric tensor.

UNIT – II


UNIT – III

Relativistic Mechanics : Variation of mass with velocity Equivalence of mass and energy, Transformation Eq^n for mass, momentum and energy, Energy momentum four vectors, Relativistic force and transformation equation for its components, Relativistic Lagrangian and Hamiltonian Relativistic eq^n of motion of particle.

UNIT – IV

Electromagnetism : Maxwell’s equation in vacuum, Transformation equations for density of electric charge and current, propagation of electric and magnetic field strength, Transformation equations for electromagnetic four potential vector, Lagrangian for a charged particle in an electromagnetic field. Lorentz force. The electromagnetic field tensor Maxwell’s eq^n in tensor form, Lorentz force on a charged particle.
Reference Books :-

1. Lectures on Special Relativity
   
   Prof. T. M. Karade, K. S. Adhav and Maya S. Bendre, Sonu Nilu.


   1969.


SYLLABUS
B. Sc. III (Semester – VI)
Paper – VI (Optional )
MAT 306 : Number Theory and Discrete Mathematics
Total Marks : 75 (60+15)

UNIT – I
Diophantine equation $ax + by = c$ congruence, Fermat’s theorem, Wilson’s theorem.

UNIT – II
Linear congruencies simultaneous linear congruence. Higher degree congruencies order of integers $(\mod m)$

UNIT – III
Basic concept of graph theory undirected and directed graph, Simple graph, multi graph, pseudo graph Degree of vertex indegree and outdegree sub graphs and isomorphic graph, paths cycles, connectivity. Trees and their Properties spanning tree. BFS Algorithm DFS algorithm properties Binary trees.

UNIT – IV
Lattices and Boolean Algebra

Text Book: - For (Unit I & II)
Number Theory
S G Telang, Edited By M. G. Nadkarni & J. S. Dani

For (Unit III & IV)
Discrete Mathematical Structures with Applications to Computer Science
J. P. Tremblay, R. Manohar
Tata McGraw-Hill Edition

Reference Books:
1. An Introduction to the Theory of Numbers ± I. Niven and H. Zuckerman
2. Elementary Number Theory & Its Applications ± Kenneth Rosen
3. Discrete Mathematical structures by Bernard Kolman, Robert C. Busby, Sharon Ross,
   Prentice- Hall of India