SEMESTER I

CC I - DIFFERENTIAL CALCULUS AND TRIGNOMETRY

Internal : 25                  Subject Code : UMA
External  : 75                  Exam Hours : 3

UNIT I
Method of Successive differentiation - Leibnitz’s Theorem and its applications- Increasing & Decreasing functions. (Chap. III: Sec 1.1 - 2.2, Chap. IV: Sec 2.1 – 2.2)

UNIT II
Curvature – Radius of curvature in Cartesian and in Polar Coordinates – Jacobians. (Chap. X: Sec 2.1-2.3 & 2.6)

UNIT III
Centre of Curvature – Evolutes & Involutes - Maxima and Minima of function of two variables. (Chap. X: Sec 2.4,2.5 & Chap.V: Sec 1.1-1.4)

UNIT IV
Hyperbolic functions – Relation between Hyperbolic functions – Relations between hyperbolic functions corresponding to relations between Circular functions - Inverse hyperbolic functions. (Chap. II: Sec 2.1-2.2)

UNIT V
Logarithm of a complex number – Summation of Trigonometric series – Difference method - Angles in arithmetic progression method – Gregory’s Series . (Chap. III & Chap. IV: Sec 4.1, 4.2 & 4.4)

TEXT BOOK(S)


REFERENCE(S)

SEMMESTER I
CC II - CLASSICAL ALGEBRA

Internal     :  25                      Subject Code : UMB
External     :  75                      Exam Hours :  3

UNIT I
Forming the equations with the given roots - Relation between the roots and coefficients - Symmetric functions - Sum of the n\textsuperscript{th} powers of the roots – Newton’s theorem on the sum of the powers of the roots.(problems only).( chap 6; sec 9 -14).

UNIT II
Transformation of equations – Reciprocal equations- Diminishing, Increasing, Multiplying the roots – Descarte’s rule of signs – Simple problems.(chap 6; sec .15,16,17,18 & 24)

UNIT III

UNIT IV
Types of Matrices - Symmetric, Skew-symmetric, Orthogonal, Hermitian, Skew-Hermitian and Unitary matrices – The Inverse of the matrix(except theorem 7.22) – Rank of the matrix ( definitions and simple problems)

UNIT V
Simultaneous linear equations ( except proof of the theorem )- Characteristic equation and Cayley Hamilton’s Theorem (statement only) – Finding inverse of matrix using Cayley Hamilton’s theorem -Eigen values and Eigen vectors – Properties of eigen values (without proof)- simple problems-

Text Books:

Reference Books:
1. Algebra – M. L. Khanna
2. Modern Algebra – K. Balakrishnan and N. Ramabathran
SEMESTER II
CC III - INTEGRAL CALCULUS

Internal : 25
External : 75

Subject Code : UMC
Exam Hours : 4

UNIT I
Revision of all integral models – simple problems.

UNIT II
Definite integrals - Integration by parts, reduction formula, Bernoulli’s Formula.

UNIT III
Geometric Application of Integration-Area under plane curves: Cartesian co-ordinates - Area of a closed curve - Examples - Areas in polar co-ordinates.

UNIT IV
Double integrals – changing the order of Integration – Triple Integrals.

UNIT V
Beta & Gamma functions and the relation between them – Integration using Beta & Gamma functions

TEXT BOOK(S)

UNIT I : Chapter 1 section 1 to 10
UNIT II : Chapter 1 section 11, 12, 13 & 15.1
UNIT III : Chapter 2 section 1.1, 1.2, 1.3 & 1.4
UNIT IV : Chapter 5 section 2.1, 2.2 & sec 4
UNIT V : Chapter 7 section 2.1 to 2.5

REFERENCE:
SEMESTER II
CC IV - ANALYTICAL GEOMETRY OF THREE DIMENSIONS

Internal : 25  
External : 75  
Subject Code : UMD  
Exam Hours : 3

UNIT I
Coordinates in space - Direction cosines of a line in space - equation of a plane in normal form. Angle between planes - Distance of a plane from a point.

UNIT II
Straight lines in space - line of intersection of planes - plane containing a line. Coplanar lines - skew lines and shortest distance between skew lines - length of the perpendicular from point to line.

UNIT III
General equation of a sphere - Section of sphere by plane - tangent planes - condition of tangency - system of spheres generated by two spheres - System of spheres generated by a sphere and plane.

UNIT IV
The equation of surface - cone - intersection of straight line and quadric cone - tangent plane and normal.

UNIT V
Condition for plane to touch the quadric cone - angle between the lines in which the plane cuts the cone. Condition that the cone has three mutually perpendicular generators - Central quadrics - intersection of a line and quadric - tangents and tangent planes - condition for the plane to touch the conicoid.

TEXT BOOK

Unit I : Chapter I, Sec 1.5 to 1.9, Chapter II Sec 2.1 to 2.3, Pages : 10-31,
Chapter II Sec 2.4 to 2.8 pages : 32-47 of [1]
Unit II : chapter III section 3.1-3.7, pages 55-89 of [1]
Unit III : Chapter VI Sec. 6.1 to 6.6 pages : 121-143 of [1]
Unit IV : Chapter V Sec.43 to 47 pages : 103-113 of [2]
Unit V : Chapter V Sec.49 to 53, Pages:115-125 of [2]

Book for Reference
1. P.Duraipandian & others- Analytical Geometry 3 Dimensional
SEMESTER III
CC V - DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS

Internal : 25
External : 75

Subject Code : UME
Exam Hours : 3

UNIT I
Linear Differential equations with constant coefficients – Evaluation of particular integral of e^{ax}, \cos ax, \sin ax, x^k, where k is a positive integer and e^{ax} f(x), where f(x) is any function of x. (Chapter 2: sections 1 to 4)

UNIT II
Linear Equations with variable Coefficients: to find the particular integral – Equations reducible to linear homogeneous equation- method of variation of parameters (Chapter 2: sections 8 to 10)

UNIT III
Partial Differential Equations: Formation of equations by elimination of constants and arbitrary functions - General, particular, complete and singular integral (Geometrical meaning not expected) - Solutions of first order equations of the standard forms. ( Chapter 4: Sections 1 to 3 and 5.1- 5.4)

UNIT IV
Equations reducible to the standard forms- Lagrange’s equation – Charpit’s method( Chapter 4: Sections 5.5,6,7)

UNIT V
Laplace Transforms - Standard formulae – Some general Theorems (statement only)and Simple Applications - Inverse Laplace transforms (problems only) - Application to the solution of Second order ordinary differential equations with constant coefficients.(Chapter 5 : Sections: 1,2,4,6,7,8)

Text Book:

Reference Books:
1. Differential equations - M.L.Khanna
2. Engineering Mathematics (Vol II) – M.K.Venkatraman
SEMESTER III
CC VI - VECTOR CALCULUS AND FOURIER SERIES

Internal : 25  Subject Code : UMF
External : 75  Exam Hours : 3

UNIT I
Vector differentiation –velocity & acceleration-Vector & scalar fields –Gradient of a vector - Unit vector normal to the surface - Directional derivative – divergence & curl of a vector - Solenoidal & irrotational vectors .- Formula involving operator $\nabla$- Operators involving $\nabla$ twice and problems.

UNIT II
Vector integration : Line integral- conservative field – volume integral -surface integral-(problems and theorem statement only)

UNIT III
Gauss Divergence Theorem –Green’s theorem- Stoke’s Theorem (Statements Only) – Simple Problems( verification of theorem.)

UNIT IV
Fourier series – Definition – Fourier series expansion of periodic functions with period $2\pi$.

UNIT V
Even and odd functions definition-properties-use of these functions in fourier series– Half range Fourier series.-Development in cosine series-Development in sine series

Text Book:


Reference Books
SEMESTER III
NME I - Mathematics for Competitive Examinations I

Internal : 25
External : 75
Subject Code: UME1
Exam Hours : 3

Unit I
Series Completion: Number Series - Alphabet Series  (P. No. 139 – 159)

Unit II
Coding – Decoding: Letter Coding – Number Coding – Matrix Coding
(P. No. 169 – 192)

Unit III
Blood Relation: Deciphering jumbled up descriptions – Relation Puzzle – Coded Relations.(P.No. 220 – 241)

Unit IV
Puzzle Test: Seating / Placing arrangements – Comparison Test.
(P.No. 253 – 278)

Unit V
Direction Sense Test – Logical Venn Diagram
(P.No. 324 – 333 , 348 – 366)

Text Book:
“A modern approach to Verbal and Non-Verbal Reasoning” by R.S. Agarwal,
S.Chand & Company Ltd, New Delhi- 55.
SEMESTER IV
CC VII - SEQUENCES AND SERIES

Internal : 25
External : 75
Subject Code: UMG
Exam Hours : 3

UNIT I :
Sequences  Limit of a sequence – Convergence Theorems on limits – Cauchy’s first Theorem on limit – Upper and lower bounds of an aggregate – Bounded sequences – Upper and lower limits of a sequence - Cauchy’s general principle of convergence – Monotonic sequence – Monotonic sequence always tends to a limit finite or infinite.

UNIT II :
Infinite series: Sum to infinity – Definition of convergence, divergence and oscillation – convergence of Geometric series – some general theorems on infinite series Series of positive terms - Comparison tests – Convergence of \( \sum \frac{1}{n^k} \) - D’ Alembert’s ratio test — Raabe’s test – Simple Problems.

UNIT III :
Cauchy’s Condensation test – Cauchy’s root test - Simple problems – Alternating series with problems.

UNIT IV :
Binomial Theorem for a rational index – Exponential and Logarithmic series – Summation of series – Approximations using these theorems

UNIT V:
General summation of series including successive difference and recurring series.

Text Books:

Reference Books:
1 A first Course in Real Analysis – M.K. Singal & Asha Rani Singal
2 Sequence and Series – S. Arumugam and others.
UNIT I:
Prime and composite numbers-Coprimes-Sieve of Eratosthenes Euclid’s theorem-Unique factorization-Fundamental theorem of Arithmetic –Positional representationof integers-Number of divisors-Sum of divisors-Symbols
\[d(n), \sigma(n)\] -Arithmetic functions.

UNIT II:
Perfect number-Greatest integer function-Mobious function \(\mu(n)\)-Inversion formula and its converse.

UNIT III:
Distribution of Primes-Fermat conjecture-Fermat numbers-Gold Bach”S conjecture-Mersenne numbers Gap theorem-Infinitely of primes.

UNIT IV:
Congruence- Definition –Residue classes-Complete and least residue system-Linear congruences-Solution of congruences-Chinese remainder theorem.

UNIT V:
Quadratic reciprocity-Quadratic residues and non residues-Eulers criterion-Primitive roots is a quadratic non residues-Legendre symbol-Gauss lemma-Quadratic reciprocity law.


REFERENCES
SEMESTER IV
SBE I – INTRODUCTION TO MATLAB

Internal : 25  
External : 75  

Subject Code: UMS1  
Exam Hours : 3

Unit I
Getting Started - MATLAB Basics (Chapters 1 & 2)

Unit II
Interacting with MATLAB (Chapter 3)

Unit III
Beyond the Basics (Chapter 4)

Unit IV
MATLAB Graphics (Chapter 5)

Unit V
MATLAB Programming (Chapter 7)

Text Book:

Reference Books:
1. Basics of MATLAB and Beyond – Andrew Knight

2. MATLAB Primer – Timothy A. Davis and Kermit Sigmon
SEMESTER IV
NME II - Mathematics for Competitive Examinations II

Internal: 25
External: 75
Subject Code: UME2
Exam Hours: 3

Unit 1

**Number, Ranking and Time Series Test:**

Number Test – Ranking Test –
Time sequence Test (P. No. 417 – 432)

Unit 2

**Mathematical Operations:** Problem Solving by Substitution – Interchange of signs and numbers – Deriving the appropriate conclusion (P. No. 432 – 454)

Unit 3

**Arithmetical Reasoning:** Calculation based Problem – Data based question – Problem on ages – Venn diagram based questions (P. No. 459 – 474)

Unit 4

Inserting the Missing character (P. No. 475 – 492)

Unit 5

Data sufficiency – Logical Sequence of Words – Logical Reasoning.
(P. No. 495 – 506, 455 – 458, Part II 1 - 14)

Text Book:

“A modern approach to Verbal and Non-Verbal Reasoning” by R.S. Agarwal, S.Chand & Company Ltd, New Delhi- 55.
SEMESTER V
CC IX – ALGEBRA

Internal : 25
External : 75

Subject Code: UMI
Exam Hours : 3

Unit I
Groups: Subgroups – Cyclic groups – Order of an element – Cosets and Lagrange’s Theorem (Sections 3.5 to 3.8)

Unit II
Normal subgroups and quotient groups – Finite groups and Cayley’s theorem – isomorphism and homomorphism (Sections 3.9 to 3.12).

Unit III

Unit IV
Vector spaces - Definition and examples – Subspaces – Linear transformation- Span of a set – Linear independence. (Sections 5.1 to 5.5).

Unit V
Basis and dimension – Rank and Nullity – Matrix of a linear transformation. (Sections 5.6 to 5.8).

Text Book:

SEMESTER V  
CC X - REAL ANALYSIS

Internal : 25   Subject Code: UMJ
External : 75   Exam Hours : 3

UNIT I
Real number system: Absolute value of a real number and its properties –
Supremum and Infimum of a set – Order Completeness Property – Countable and
Uncountable sets. (Sections: 1.5 - 1.7 & 1.10)

UNIT II
Continuity of Functions – Types of discontinuous functions – Algebra of
Continuous functions – Intermediate value Theorem – Inverse function theorem and
Uniform continuity of a function. (Sections: 5.3, 5.4, 5.6 to 5.8)

UNIT III
Derivability and continuity – Algebra of derivatives – Inverse function theorem –
Darboux’s theorem. (Sections: 6.1 to 6.5)

UNIT IV
Rolle’s Theorem – Mean value theorems on derivatives - Taylor’s theorem with
remainder. (Sections: 8.1 to 8.5)

UNIT V
Riemann integration: Definition – Darboux’s theorem –Conditions of Integrability
– Integrability of continuous and monotonic functions – Properties of Integrable functions
– Integral functions – Continuity and derivability of Integral functions – The first Mean
value Theorem – fundamental theorem of integral calculus.
(Chapter 6)

TEXT BOOKS:
1. For units I to IV - “A first course in Real Analysis” by M.K. Singal and Asha
2. For unit V – “A Course of Mathematical Analysis” by Shanthi Narayan.

REFERENCES:
1. A First course in Real Analysis – Walter Rudin.
2. Real Analysis – Shanthi Narayan.
SEMESTER V
- CORE COURSE XI – MECHANICS

Internal : 25
External : 75
Subject Code : UMK
Exam Hours : 3

UNIT I

Equilibrium of a Particle – Triangle of Forces – Lami’s Theorem – Moment of a Force – General Motion of a Rigid Body – Parallel Forces – Varigon’s Theorem – Forces along the sides of a triangle - Couples. (Chapter 3: Section 3.1, Chapter 4: Sections 4.1, 4.2, 4.4, 4.5, 4.6)

UNIT II

Hanging strings – Equilibrium of a uniform homogeneous strings – Suspension bridge – Simple Problems. (Chapter 9: Sections 9.1 & 9.2)

UNIT III

Rectilinear motions under varying force – Simple Harmonic Motion S.H.M along a horizontal line – S.H.M. along a vertical line – Projectiles – Forces on a Projectiles – Projectile projected on an inclined plane – enveloping Parabola. (Chapter 12: sections 12.1 to 12.3 & 13.1 to 13.3)

UNIT IV


UNIT V

Central orbits – General orbits – Central orbit – Conic as a centered orbit - Moment of Inertia – Perpendicular and Parallel axes theorems. (Chapter 16: Sections 16.1, 16.2, 16.3 & Chapter 17 : 17.1)

TEXT BOOK:


REFERENCE BOOKS:

SEMESTER V
MBE I - OPERATIONS RESEARCH

Internal : 25  Subject Code: UME3
External : 75  Exam Hours : 3

UNIT I : Linear Programming Problem – Mathematical Formulation of L.P.P – Graphical Solution – Introduction – Graphical Solution method – Some exceptional cases – General Linear Programming Problem – Canonical and Standard form of LPP – Simplex method – Introduction - The computational Procedure. (Excluding Theorems ); (Sections 2.1 , 2.2 , 3.1 to 3.5 , 4.1 , 4.3 )


UNIT III : Transportation Problem – Introduction – General Transportation problem – Finding Initial Basic feasible Solution – Test for Optimality – Transportation Algorithm (MODI Method); (Sections: 10.1 , 10.11)


TEXT BOOK:

REFERENCE BOOKS:
1  Operations Research - S. Dharani Venkatakrishnan.
2  Operations Research - Gupta and Hira.
3  Operations Research (6th edition )- Hamdy A. Taha
SEMESTER V
SBE II - QUANTITATIVE APTITUDE

Internal : 25 Subject Code: UMS2
External : 75 Exam Hours : 3

Unit I
Blood Relation - Puzzle Test
(P. No. 220 – 241, 253 – 278)

Unit II
Number, Ranking and Time Series Test - Mathematical Operations
(P. No. 417 – 432, 432 – 454)

Unit III
Arithmetical Reasoning
(P. No. 459 – 474)

Unit IV
Inserting the Missing character
(P. No. 475 – 492)

Unit V
Data sufficiency – Logical Sequence of Words.
(P. No. 495 – 506, 455 – 458)

Text Book:
“A modern approach to Verbal and Non-verbal Reasoning” by R.S.Agarwal,
S.Chand & Company Ltd, Delhi.
SEMESTER V
SBE III – INTRODUCTION TO FUZZY MATHEMATICS

Internal : 25
External : 75
Subject Code: UMS3
Exam Hours : 3

UNIT – I

Crisp sets and Fuzzy sets – Crisp sets: an over view – The notion of Fuzzy sets –
Basic concepts of Fuzzy sets. (Sections 1.2-1.4)

UNIT – II

Operations on Fuzzy sets : General discussion – Fuzzy complement – Fuzzy
Union (Sections 2.1 – 2.3)

UNIT – III

Fuzzy Intersection – Combinations of Operations
(Sections 2.4, 2.5)

UNIT – IV

General Aggregation Operations – Crisp and Fuzzy relations – Binary relations
(Sections 2.6, 3.1, 3.2)

UNIT – V

Binary relations on a single set – Equivalence and Similarity relations - Compatibility and
tolerance relations – Orderings.
(Sections 3.3 - 3.6)

TEXT BOOK:
‘Content and treatment as in ‘Fuzzy Sets, Uncertainty and Information’, by
George J.Klir and Tina A. Folger, Prentice Hall of India, New Delhi, 2006’.

REFERENCE(S)
New Delhi, 1991.

Delhi, 1995.
UNIT I
Analytic Functions: Functions of complex variable – C.R. Equations – Analytic functions
- Harmonic functions. (Sections 2.1, 2.6 to 2.8)

UNIT II
Bilinear Transformations: Elementary transformations – Bilinear transformations – Cross ratio – Fixed points of bilinear transformations. (Sections 3.1 to 3.4)

UNIT III
Complex Integration: Definite integral – Cauchy’s theorem – Cauchy’s integral formula – Higher derivatives. (Sections 6.1 to 6.4)

UNIT IV
Series Expansions: Taylor’s series – Laurent series – zeros of analytic functions – Singularities. (Sections 7.1 to 7.4)

UNIT V
Calculus of Residues: Residues – Cauchy’s residue theorem – Evaluation of definite integrals. (Sections 8.1 to 8.3)

TEXT BOOK:

REFERENCE BOOKS:
SEMESTER VI
CC XIII – NUMERICAL METHODS WITH ‘C’
PROGRAMMING

Internal : 25
Subject Code : UMM
External : 75
Exam Hours : 3

UNIT I
Structure of C programs-Constants, Variables and Data types-Operators and Expressions- Mathematical functions-Input and output operators.

UNIT II
Decision making and Branching-IF statements-GOTO statement-Decision making and looping - WHILE, DO, FOR statements-Arrays

UNIT III
Handling of character strings - Arithmetic operations on characters - String handling functions - User defined functions - Recursion..

UNIT IV
Bisection method, false position method and Newton Raphson method - Solving simultaneous algebraic equations - Gauss-Seidel method - Gauss elimination method..

UNIT V
Interpolation - Newton”s forward and backward difference formulae - Lagrange”s interpolation formula - Numerical integration using Trapezoidal and Simpson”s one-third rules - solution of ODE”s - Euler method and Runge-Kutta fourth order method.

Books for Study:
Unit 1: Chapters 1-4 of [1]
Unit 2: Chapters 5-7 of [1]
Unit 3: Chapters 8-9 of [1]
Unit 4: Chapter 1, Sections 1.7-1.8, Chapter 3, Sections 2, 4 and 5, Chapter 4, Sections 2, 6 of [2]
Unit 5:Chapter 6,Sec 3,4, Chapter 8, Sec 4, Chapter 9, Sec 8,10, Chapter 11, Sec10,16 of [2]

Books for Reference:
1. Solving a Quadratic Equation.
2. Sum of series (Sine, Cosine, $e^x$)
3. Ascending and descending order of numbers.
4. Largest and smallest of given numbers.
5. Sorting names in alphabetical order.
6. Finding factorial, generating Fibonacci numbers using recursive functions.
8. Mean Standard Deviation and Variance.
9. Solving equations by Bisection method
10. Solving equations by False position method
11. Solving equations by Newton –Raphson method
12. Gauss elimination method of solving simultaneous equations
13. GAUSS-Seidel method of solving simultaneous equations
14. Euler method, Trapezoidal and Simpson's 1/3 rd rule of integration
SEMESTER VI
CC XIV – ASTRONOMY

Internal : 25
External : 75
Exam Hours : 3

UNIT – I

Relevant properties of a sphere and relevant formulae of Spherical trigonometry
(Relevant properties and formulae without proofs) - Celestial Sphere – Diurnal motion.
(Chapter I and II)

UNIT – II

Earth – Dip of the horizon – Twilight – Astronomical refraction – Tangent and
cassinie’s formulae – Properties and simple problems applying them.
(Chapter III – Sections 1, 5 and 6 & Chapter IV full)

UNIT – III

Kepler’s laws of Planetary motion (Statement only) – Newton’s deducations from
them (Statements only) – Three anomalies of the earth and relations between them –
Times – Equation of time – Seasons.
(Chapter VI – Articles 146, 153, 158 to 164 and Chapter VII – Sections 1, 2)

UNIT – IV

Geocentric parallax – Annual parallax – Aberration of light – Simple problems in
the above (Chapters V, VIII and IX)

UNIT – V

Moon – Phases of Moon – Harvest Moon – Metonic cycle – Lunar Mountain –
Earth shine – Tides – Eclipses.(Chapter XII – Articles 229 – 242 and 249 – 255 and
Chapter XIII)

TEXT BOOK: Astronomy” by Kumaravelu and Susila Kumaravelu.

REFERENCE BOOKS: 1. Astronomy for Degree Classes by Dr. S.M. Sirajudeen.
2. Astronomy by G.V. Ramachandran.
3. Astronomy by M.L. Khanna.
SEMESTER VI
MBE II - STOCHASTIC PROCESSES

Internal : 25  Subject Code : UME4
External : 75  Exam Hours : 3

UNIT I

UNIT II
Classification of states and chains- Determination of higher transition probabilities-Stability of a Markov system.(sec 3.4 and 3.6)

UNIT III
Markov Processes with discrete statespace: Poisson process and its extension- Poisson process-Poisson process and related distribution-Generalization of Poisson process- Birth and death process(sec4.1-4.4)

UNIT IV
Renewal processes and Theory: Renewal processes- Renewal processes in continuous time- Renewal equation- Stopping Time: Wald’s equation(sec 6.1- 6.4)

UNIT V
Stochastic processes in Queueing and Reliability: Queueing system: General concepts-The Queueing model M/M/1: Steady state behavior-Transient behavior of M/M/1 model.(sec 10.1-10.3).


References:

1. First course in Stochastic Processes by Samuel Karlin.
SEMESTER VI
MBE III - GRAPH THEORY

Subject Code: UME5
Exam Hours : 3

UNIT I
Introduction- Definition finite and infinite graphs- Incidence and degree-Isolated vertex,
null graph-Walk, path and circuits - connected and disconnected graphs -Euler graphs-
Operation on graphs- Hamiltonian path and circuits.
(Sections 1.1 to 1.5, 2.4 to 2.9)

UNIT II
Trees and Fundamental Circuits - Trees- Properties of trees - Pendant vertex in a tree-
On counting trees - Spanning tress- Fundamental circuits - Finding all Spanning trees.(Sections 3.1 to 3.9)

UNIT III
Cut sets- Properties of a cut set - All cut sets in a graph - Fundamental circuits and cut sets- Connectivity and separability. (Section 4.1 to 4.5)

UNIT IV
Planner graphs - Kuratowski's two graphs - Different representations of a planner Graphs - Detection of planarity - Geometric dual. (Section 5.2 to 5.6)

UNIT V
Chromatic number - Chromatic partitioning - Chromatic polynomial - matching -
Coverings - Four color problem. (Section 8.1 to 8.6)

TEXT BOOK:
"Graph theory with applications to Engineering and computer science" by Narsing Deo, Prentice-Hall of India Private limited, New Delhi,1986.

REFERENCE BOOKS:
1.Graph Theory – Harary