DON BOSCO ARTS & SCIENCE COLLEGE

ANGADIKADAVU

(Affiliated to Kannur University Approved by Government of Kerala)

ANGADIKADAVU P.O., IRITTY, KANNUR – 670706

COURSE PLAN

Mathematics

(2020 – 22)

SEMESTER - III

ACADEMIC YEAR - (2021-22)

III Semester MSc Mathematics (2020 - 22)			
SL. No.	Name of Subjects with Code	Name of the Teacher	Duty Hours per week
1.	MAT3C11: NUMBER THEORY	ATHULYA P	5
2.	MAT3C12: FUNCTIONAL ANALYSIS	ANIL M V	5
3.	MAT3C13: COMPLEX FUNCTION THEORY	AJEENA JOSEPH	5
4.	MAT3C14: ADVANCED REAL ANALYSIS	NOBLE PHILIP	5
5.	MAT3E01: Graph Theory (Elective)	PRIJA V	5
	Name of Class Incharge	PRIJA V	

TIME TABLE

Day	09.50 Am - 10.45 Am	10.45 Am - 11.40 Am	11.55 Am - 12.50 Pm	01.40 Pm - 02.35 Pm	02.35 Pm - 03.30 Pm	03.35 Pm - 04.30 Pm
1	COMPLEX FUNCTION THEORY	ADVANCED REAL ANALYSIS	FUNCTIONL ANALYSIS	NUMBER THEORY	Graph Theory	LIBRARY
2	ADVANCED REAL ANALYSIS	Graph Theory	COMPLEX FUNCTION THEORY	FUNCTIONL ANALYSIS	NUMBER THEORY	LIBRARY
3	NUMBER THEORY	ADVANCED REAL ANALYSIS	Graph Theory	COMPLEX FUNCTION THEORY	FUNCTIONL ANALYSIS	LIBRARY
4	Graph Theory	FUNCTIONL ANALYSIS	NUMBER THEORY	ADVANCED REAL ANALYSIS	COMPLEX FUNCTION THEORY	LIBRARY
5	FUNCTIONL ANALYSIS	NUMBER THEORY	COMPLEX FUNCTION THEORY	Graph Theory	ADVANCED REAL ANALYSIS	LIBRARY
6	ADVANCED REAL ANALYSIS	FUNCTIONL ANALYSIS	Graph Theory	NUMBER THEORY	COMPLEX FUNCTION THEORY	LIBRARY

Subject Code:	**MAT3C11**
Subject Name:	**Number Theory**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**6**
Name of the Teacher:	**Athulya P**

MAT3C11: NUMBER THEORY

Textbooks:

1. Tom M Apostol: Introduction to Analytic Number Theory; Springer International Student Edtion
2. D.M Burton: Elementary Number Theory (6th Edition) Mc Graw Hill
3. lan Stewart and David Tall: Algebraic Number Theory and Fermal's last theorem (Third Edition) A K Peters Natick Massachussets

Unit I

The Fundamental theorem of Arithmetic: Introduction-Divisibility-Greatest common divisor-
prime numbers- The fundamental theorem of arithmetic-The series of reciprocals of primes-
The Euclidean algorithm-The greatest common divisor of more than two numbers.
(Text 1, Sectons1.1-1.8)

Arithmetical Functions and Dirichlet multiplication: Introduction- The Mobius function $\mu(n)$
–The Euler totient function $\phi(n)$ –The relation connecting μ and ϕ -the product formula for
$\phi(n)$ –The Dirichlet product of arithmetical functions- Dirichlet inverses and Mobius inversion formula- The Mangolt function $\Lambda(n)$ –Multiplicative functions- Multiplicative
functions and Dirichlet multiplication- The inverse of a completely multiplicative function-
Liouville's function $\lambda(n)$- The divisor function $\sigma\alpha(n)$.
(Text 1, Section 2.1-2.13)

Congruences: Definition and basic properties of congruences- Residue classes and complete
residue system- Liner Congruences-Reduced residue system and the Euler- Fermat theorem-
Polynomial congruences modulo P and Langrange's theorem- Applications of Langrange's

theorem- Simultaneous linear congruences and Chinese Remainder theorem- Applications of
Chinese remainder theorem- Polynomial congruences with prime power moduli.
(Text 1, Section 5.1-5.9)

Unit II
Quadratic Residues and Quadratic Reciprocity Law: Quadratic residues- Legendre's symbol and its properties- Evaluation of (-1□p) and (2 □p) Gauss lemma-The quadratic
reciprocity law –Applications of the reciprocity law – The Jacobi symbol- Applications to
Diophantine equations.
(Text 1, Sections 9.1 –9.8)

Primitive Roots: The exponent of number mod m and primitive roots- Primitive roots and
reduced residu; system- The nonexistence of primitive roots mod 2a for $\alpha \geq 3$- The existence
of primitive roots mod p for odd primes p- Primitive roots and quadratic residues – The
existence of primitive roots and Pa
- The existence of primitive roots mod 2 Pa –The
nonexistence of Primitive roots in the remaining cases- The number of primitive roots mod
m.
(Text 1, Sections 10.1-10.9)

Introduction to Cryptography; From Caesar Cipher to Public Key Cryptography-The Knapsack Crypto system- An application of primitive roots to Cryptography.
(Text 2, Sections 10.1-10.3)

Unit III
Algebraic Backgrounds: Symmetric polynomials- modules- free abelian groups
(Text 3, Section 1.4-1.6)
Algebraic Numbers: Algebraic numbers- Conjugates and Discriminants- Algebraic integers-
Integral bases- Norms and Traces- Rings of integers.
(Text 3, Section 2.1-2.6)
Quadratic and Cyclotomic fields: Quadratic fields-Cyclotomic fields.
(Text 3, Sections 3.1-3.2)

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	12-07-2021 To 17-07-2021	1	Introduction-Divisibility
		2	Properties of divibility
		3	Greatest common divisor
		4	Greatest common divisor
		5	Thorem
		6	Prime numbers
2	19-07-2021 To 24-07-2021	7	The fundamental theorem of arithmetic
		20 July	**Bakrid- Holiday**
		8	The fundamental theorem of arithmetic
		9	The series of reciprocals of primes
		10	Arithmetical Functions and Dirichlet multiplication: Introduction
		11	The Mobius function μ(n)
3	26-07-2021 To 31-07-2021	12	The Euler totient function ϕ (n)
		13	The relation connecting μ and ϕ
		14	The product formula for ϕ (n)
		15	The Dirichlet product of arithmetical functions
		16	Dirichlet inverses and Mobius inversion formula
		17	Dirichlet inverses and Mobius inversion formula
4	02-08-2021 To 07-08-2021	18	The Mangolt function Λ(n)
		19	Multiplicative functions
		20	Examples
		21	Multiplicative functions and Dirichlet multiplication
		22	The inverse of a completely multiplicative function
		23	Liouville's function λ(n)
5	09-08-2021 To 14-08-2021	24	The divisor function σα(n)
		25	Class Test
		26	Definition and basic properties of congruences
		27	Residue classes and complete residue system

No of Weeks	Dates	Session	Topic
		28	Residue classes and complete residue system
		29	Liner Congrunces
6	16-08-2021 To 21-08-2021	30	Reduced residue system
		31	Euler- Fermat theorem
		32	Polynomial congruences modulo P
		19 August	**Moharam/Onam Vacation**
		20 August	Onam Vacation
		21 August	Onam Vacation
7	23-08-2021 To 28-08-2021	23 August	Onam Vacation
		24 August	Onam Vacation
		25 August	Onam Vacation
		26 August	Onam Vacation
		27 August	Onam Vacation
		28 August	Onam Vacation
8	30-08-2021 To 04-09-2021	30 August	Onam Vacation
		33	Langrange's theorem
		34	Applications of Langrange's theorem
		35	Simultaneous linear congruences
		36	Chinese Remainder theorem
		37	Applications of Chinese remainder theorem
9	06-09-2021 To 11-09-2021	38	Polynomial congruences with prime power moduli.
		39	Class Test
			STUDY LEAVE
			STUDY LEAVE
			STUDY LEAVE
			STUDY LEAVE
10	13-09-2021 To 18-09-2021		STUDY LEAVE
			STUDY LEAVE
			I SEMESTER PG EXAMINATION
			I SEMESTER PG EXAMINATION
			I SEMESTER PG EXAMINATION
			I SEMESTER PG EXAMINATION
11	20-09-2021 To		I SEMESTER PG EXAMINATION
		21 September	Sree Narayana Guru Samadhi
			I SEMESTER PG EXAMINATION

No of Weeks	Dates	Session	Topic
	25-09-2021		I SEMESTER PG EXAMINATION
			I SEMESTER PG EXAMINATION
		40	Quadratic residues
12	27-09-2021 To 02-10-2021	41	Legendre's symbol and its properties-
		42	Gauss lemma
		43	The quadratic reciprocity law
		44	Applications of the reciprocity law
		45	The Jacobi symbol-
		2 October	**Gandhi Jayanthi**
13	04-10-2021 To 09-10-2021	46	Applications to Diophantine equations.
		47	The exponent of number mod m and primitive roots
		48	Primitive roots and reduced residu; system
		49	The nonexistence of primitive roots mod 2a for $\alpha \geq 3$
		50	The existence of primitive roots mod p for odd primes p
		51	Primitive roots and quadratic residues
14	11-10-2021 To 16-10-2021	52	The number of primitive roots mod m.
		53	Seminar
		54	Seminar
		14 October	**Mahanavami**
		15 October	**Vijayadasami**
		55	Seminar
15	18-10-2021 To 23-10-2021	56	Seminar
		19 October	Milad-i-Sherif
		57	Seminar
		58	Seminar
		59	Seminar
		60	Seminar
16	25-10-2021 To 30-10-2021	61	**INTERNAL EXAMINATION**
		62	**INTERNAL EXAMINATION**
		63	**INTERNAL EXAMINATION**
		64	**INTERNAL EXAMINATION**

No of Weeks	Dates	Session	Topic
		65	**INTERNAL EXAMINATION**
		66	Symmetric polynomials
17	01-11-2021 To 06-11-2021	67	Symmetric polynomials
		68	Modules
		69	Modules
		4 November	Diwali
		70	Class Test
		71	free abelian group
18	08-11-2021 To 13-11-2021	72	free abelian group
		73	Algebraic numbers
		74	Algebraic numbers
		75	Conjugates and Discriminant
		76	Algebraic integers
		77	Integral bases
19	15-11-2021 To 19-11-2021	78	**INTERNAL EXAMINATION**
		79	**INTERNAL EXAMINATION**
		80	**INTERNAL EXAMINATION**
		81	**INTERNAL EXAMINATION**
		82	**INTERNAL EXAMINATION**
		83	Norms and traces
20	22-11-2021 To 26-11-2021	84	Rings of integers.
		85	Class Test
		86	Quadratic fields
		87	Quadratic fields
		88	Cyclotomic fields
		89	Revision
21	29-11-2021 To 03-12-2021	90	Revision
			II SEMESTER PG EXAMINATION
			II SEMESTER PG EXAMINATION
			II SEMESTER PG EXAMINATION
			II SEMESTER PG EXAMINATION
			II SEMESTER PG EXAMINATION
22	06-12-2021 To 10-12-2021		**II SEMESTER PG EXAMINATION**
			II SEMESTER PG EXAMINATION

Subject Code:	**MAT3C12**
Subject Name:	**Functional Analysis**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**6**
Name of the Teacher:	**Anil M V**

MAT3C12: FUNCTIONAL ANALYSIS

Unit I
Fundamentals of Normed Spaces; Normed Spaces, Continuity of Linear Maps, Hahn-Banach Theorems, Banach spaces.
(Chapter-2, Sections 5, 6, 7 and 8 [omitting Banach Limits from Section 7])

Unit II
Bounded Linear Maps on Banach Spaces; Uniform Boundedness Principle, Closed Graph and Open Mapping Theorems, Bounded Inverse Theorem
(Chapter-3, Sections 9, 10 and 11, Omitting Divergence of Fourier Series of Continuous Functions, Quadrature Formula and Matrix Transformation and Summability Methods of Section 9)

Unit III
Geometry of Hilbert Spaces; Inner Product Spaces, Orthonormal Sets. Approximation and Optimization, Projection and Riesz Representation Theorems.
(Chapter-6, Sections 21, 22, 23 and 24 [Omit 23.2, 23.6 from section 23 and Weak Convergence and Weak Boundedness from Section 24]

Text Book; Balmohan V Limaye; Functional Analysis (Third Edition); New Age International Publishers.

Reference:

1. E.Kreyszig; Introductory Functional Analysis with Applications, John Wiley
2. Walter Rudin; Functional Analysis, TMH Edtions 1978
3. M.T Nair; Functional Analysis A First Course; Prentice Hall of India.
4. Chaudhary and Sudarsan Nanda; Functional Analysis with Applications, Wiley Eastern Ltd.
5. Walter Rudin; Introduction to Real and Complex Analysis, McGraw Hill International Edition
6. J.B Conway; Functional Analysis, Narosa Publishing Company
7. Bachman and Narici; Functional Analysis

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	12-07-2021 To 17-07-2021	1	Fundamentals of normed spaces
		2	Normed spaces-definition and examples
		3	Properties of normed spaces
		4	Properties of normed spaces
		5	Examples of normed spaces
		6	Examples of normed spaces
2	19-07-2021 To 24-07-2021	7	Theorem
		20 July	**Bakrid- Holiday**
		8	Theorem
		9	Riesz lemma
		10	Theorem
		11	Theorem
3	26-07-2021 To 31-07-2021	12	Definitions
		13	Theorem
		14	Continuity of linear maps
		15	Theorem
		16	Theorem
		17	Bounded linear maps
4	02-08-2021 To 07-08-2021	18	Lemma
		19	Lemma
		20	Hahn Banach separation theorem
		21	Examples
		22	Corollary
		23	Hahn Banach Extension theorem
5	09-08-2021 To 14-08-2021	24	Banach spaces
		25	Characterization of Banach spaces
		26	Theorem
		27	Theorem
		28	Embedding a normed space
		29	Theorem
6	16-08-2021 To 21-08-2021	30	Class test
		31	Bounded linear maps on Banach spaces
		32	Uniform boundedness principle
		19 August	**Moharam/Onam Vacation**
		20 August	Onam Vacation

No of Weeks	Dates	Session	Topic
		21 August	Onam Vacation
7	23-08-2021 To 28-08-2021	23 August	Onam Vacation
		24 August	Onam Vacation
		25 August	Onam Vacation
		26 August	Onam Vacation
		27 August	Onam Vacation
		28 August	Onam Vacation
8	30-08-2021 To 04-09-2021	30 August	Onam Vacation
		33	Resonance theorem
		34	Corollary
		35	Closed map and continuous map
		36	Examples
		37	Examples
9	06-09-2021 To 11-09-2021	38	Lemma
		39	Closed graph theorem
			STUDY LEAVE
			STUDY LEAVE
			STUDY LEAVE
			STUDY LEAVE
10	13-09-2021 To 18-09-2021		STUDY LEAVE
			STUDY LEAVE
			I SEMESTER PG EXAMINATION
			I SEMESTER PG EXAMINATION
			I SEMESTER PG EXAMINATION
			I SEMESTER PG EXAMINATION
11	20-09-2021 To 25-09-2021		I SEMESTER PG EXAMINATION
		21 September	Sree Narayana Guru Samadhi
			I SEMESTER PG EXAMINATION
			I SEMESTER PG EXAMINATION
			I SEMESTER PG EXAMINATION
		40	Projection maps
12	27-09-2021 To 02-10-2021	41	Open map
		42	Theorem
		43	Theorem
		44	Corollary
		45	Assignment
		2 October	**Gandhi Jayanthi**
13	04-10-2021	46	Class test

No of Weeks	Dates	Session	Topic
	To 09-10-2021	47	Definitions
		48	Theorem
		49	Theorem
		50	Definitions
		51	Theorem
14	11-10-2021 To 16-10-2021	52	Open mapping therorem
		53	Examples
		54	Examples
		14 October	**Mahanavami**
		15 October	**Vijayadasami**
		55	Theorem
15	18-10-2021 To 23-10-2021	56	Theorem
		19 October	Milad-i-Sherif
		57	Bounded inverse theorem
		58	Examples
		59	Two norm theorem
		60	Examples
16	25-10-2021 To 30-10-2021	61	**INTERNAL EXAMINATION**
		62	**INTERNAL EXAMINATION**
		63	**INTERNAL EXAMINATION**
		64	**INTERNAL EXAMINATION**
		65	**INTERNAL EXAMINATION**
		66	Inner product spaces
17	01-11-2021 To 06-11-2021	67	Seminar
		68	Seminar
		69	Seminar
		4 November	Diwali
		70	Seminar
		71	Seminar
18	08-11-2021 To 13-11-2021	72	Seminar
		73	Seminar
		74	Seminar
		75	Hilbert spaces
		76	Theorem
		77	Lemma
19	15-11-2021	78	**INTERNAL EXAMINATION**
		79	**INTERNAL EXAMINATION**
		80	**INTERNAL EXAMINATION**

No of Weeks	Dates	Session	Topic
	To 19-11-2021	81	**INTERNAL EXAMINATION**
		82	**INTERNAL EXAMINATION**
		83	Theorem
20	22-11-2021 To 26-11-2021	84	Theorem
		85	Examples
		86	Projection theorem
		87	Riez representation theorem
		88	Revision
		89	Revision
21	29-11-2021 To 03-12-2021	90	Class test
			II SEMESTER PG EXAMINATION
			II SEMESTER PG EXAMINATION
			II SEMESTER PG EXAMINATION
			II SEMESTER PG EXAMINATION
			II SEMESTER PG EXAMINATION
22	06-12-2021 To 10-12-2021		**II SEMESTER PG EXAMINATION**
			II SEMESTER PG EXAMINATION
23	13-12-2021 To 17-12-2021		
24	20-12-2021 To 24-12-2021		
25			

Subject Code:	**MAT3C13**
Subject Name:	**Complex function theory**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**6**
Name of the Teacher:	**Ajeena Joseph**

MAT3C13: COMPLEX FUNCTION THEORY

Unit I: Elliptic functions: Simple periodic functions, doubly periodic functions, the Weierstrass theory. (Chapter 7 (sections 1,2,3) of text 1). The Reimann zeta function (chapter 7(section 8) of text 2).

Unit II: Runge′s theorem, simple connectedness, Mittag-Leffler′stheorem.Analytic continuation and Reimann surfaces: Schwartz reflection principle, analytic continuation along a path, monodromy theorem. (Chapter 8 (sections 1,2,3) and chapter 9 (sections 1,2,3) of text 2)

Unit III: Harmonic functions: Basic properties of harmonic functions, Harmonic functions on a disk, sub- harmonic and super harmonic functions. Entire functions: Jensen′s formula. (Chapter 10 (sections 1,2,3), chapter 11 (section 1) of text 2).

Text 1: Lars V Ahlfors- Complex Analysis 3rd edition
Text 2: John B Coway- Functions of one complex variable 2nd edition.

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	12-07-2021 To 17-07-2021	1	Simply periodic functions
		2	Representation of exponential
		3	Fourier series with examples
		4	Functions of finite orders
		5	Examples
		6	Examples
2	19-07-2021 To 24-07-2021	7	Doubly periodic functions
		20 July	**Bakrid- Holiday**
		8	Period module
		9	Theorem
		10	Theorem
		11	Theorem
3	26-07-2021 To 31-07-2021	12	Class test
		13	Weierstrss p- function
		14	Theorem
		15	Theorem
		16	Theorem
		17	Properties
4	02-08-2021 To 07-08-2021	18	Weierstrss sigma function
		19	Weierstrass sigma function
		20	Legender's relation
		21	Class test
		22	Theorem
		23	Theorem
5	09-08-2021 To 14-08-2021	24	Theorem
		25	Assignment
		26	Theorem
		27	Reimann zeta funcyion
		28	Reimann zeta function
		29	Gamma function
6	16-08-2021 To 21-08-2021	30	Reimann functional equations
		31	Reimann functional equation
		32	Reimann hypothesis
		19 August	Moharam/Onam Vacation
		20 August	Onam Vacation

No of Weeks	Dates	Session	Topic
		21 August	Onam Vacation
7	23-08-2021 To 28-08-2021	23 August	Onam Vacation
		24 August	Onam Vacation
		25 August	Onam Vacation
		26 August	Onam Vacation
		27 August	Onam Vacation
		28 August	Onam Vacation
8	30-08-2021 To 04-09-2021	30 August	Onam Vacation
		33	Theorem
		34	Euler's formula
		35	Class test
		36	Theorem
		37	Theorem
9	06-09-2021 To 11-09-2021	38	Theorem
		39	Theorem
			STUDY LEAVE
			STUDY LEAVE
			STUDY LEAVE
			STUDY LEAVE
10	13-09-2021 To 18-09-2021		STUDY LEAVE
			STUDY LEAVE
			I SEMESTER PG EXAMINATION
			I SEMESTER PG EXAMINATION
			I SEMESTER PG EXAMINATION
			I SEMESTER PG EXAMINATION
11	20-09-2021 To 25-09-2021		I SEMESTER PG EXAMINATION
		21 September	Sree Narayana Guru Samadhi
			I SEMESTER PG EXAMINATION
			I SEMESTER PG EXAMINATION
			I SEMESTER PG EXAMINATION
		40	Runge's theorem
12	27-09-2021 To 02-10-2021	41	Runge's theorem
		42	Simple connectedness
		43	Simple connectedness
		44	Simple connectedness
		45	Theorem
		2 October	**Gandhi Jayanthi**
13	04-10-2021	46	Polynomially convex hull

No of Weeks	Dates	Session	Topic
	To 09-10-2021	47	Theorem
		48	Homeomorphic sets
		49	Assignment
		50	Theoren
		51	Theorem
14	11-10-2021 To 16-10-2021	52	Theorem
		53	Theorem
		54	MittagLeffler'stheorem
		14 October	**Mahanavami**
		15 October	**Vijayadasami**
		55	Theorem
15	18-10-2021 To 23-10-2021	56	Schwartz reflection principle
		19 October	Milad-i-Sherif
		57	Theorem
		58	Theorem
		59	Analytic continuation along a path
		60	Analytic continuation along a path
16	25-10-2021 To 30-10-2021	61	**INTERNAL EXAMINATION**
		62	**INTERNAL EXAMINATION**
		63	**INTERNAL EXAMINATION**
		64	**INTERNAL EXAMINATION**
		65	**INTERNAL EXAMINATION**
		66	Function element
17	01-11-2021 To 06-11-2021	67	Lemma
		68	Theorem
		69	Monodromy theorem
		4 November	Diwali
		70	Monodromy theorem
		71	Class test
18	08-11-2021 To 13-11-2021	72	Harmonic functions
		73	Maximum principle
		74	Maximum principle
		75	Minimum principle
		76	Poisson kernel
		77	Theorem
19	15-11-2021	78	**INTERNAL EXAMINATION**
		79	**INTERNAL EXAMINATION**
		80	**INTERNAL EXAMINATION**

No of Weeks	Dates	Session	Topic
	To 19-11-2021	81	**INTERNAL EXAMINATION**
		82	**INTERNAL EXAMINATION**
		83	Theorem
20	22-11-2021 To 26-11-2021	84	Harnack's theorem
		85	Superharmonic and subharmonic functions
		86	Class test
		87	Maximum principle
		88	Theorem
		89	Jensen's formula
21	29-11-2021 To 03-12-2021	90	Theorem
			II SEMESTER PG EXAMINATION
			II SEMESTER PG EXAMINATION
			II SEMESTER PG EXAMINATION
			II SEMESTER PG EXAMINATION
			II SEMESTER PG EXAMINATION
22	06-12-2021 To 10-12-2021		**II SEMESTER PG EXAMINATION**
			II SEMESTER PG EXAMINATION

Subject Code:	**MAT3E01:**
Subject Name:	**Graph Theory (Elective)**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of the Teacher:	**PRIJA V**

MAT3E01: Graph Theory (Elective)

Text 1 J.A Bondy and U.S Murty, Graph Theorywith Applications, The MacMillan Press
Ltd, 1976
Text 2 John Clark and Derek Allan Holtan, A First Look at Graph Theory, Allied Publishers,
Ltd

Unit I

Independent Sets and Cliques; Independent Sets, Ramsey's Theorem, Turan's Theorem,
Shur's Theorem
Vertex Colorings: Chromatic Number, Book's Theorem Hajo's Conjecture, Chromatic
Polynomials, Girth and Chromatic Number.
(Chapter 7; Except Section 7.5, Chapter 8 Except Section 8.6, Text 1)

Unit II

Edge Colourings: Edge Chromatic Number, Vizing's Theorem, The Timetabling Problem
Planar Graphs; Plane and Planar Graphs, Dual Graphs, Euler's Formula Bridges, Kuratowski's Theorem. The Five Colour Theorem Non Hamiltonian Planar Graphs.
(Chapter 6, All sections; Chapter 9; Except section 9.8 of Text 1)

Unit III

Matchings: Matchings, Matchings and Coverings in bipartite Graphs, Perfect Matchings,The
Personnel Assignment Problem, The Optimal Assignment Problem.
(Chapter 5, Sections 5.1, 5.2, 5.3, 5.4, 5.5 of text 1)
Networks; Flows and Cuts, Separating sets
(Chapter 8; Sections 8.1 & 8.3 of text 2

Reference:

1. F. Harraray, Graph Theory, Narosa Publishing House.
2. Narasingh Deo, Graph Theorywith applications to Engineering and Computer Science, PHI.
3. O.Ore, Graph and Their uses, Random House Inc, NY (1963)
4. K.D Joshi, Foundations of Discrete Mathematics, Wiley Eastern Ltd.

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	12-07-2021 To 17-07-2021	1	UNIT I-Introduction.
		2	Independent Sets and Cliques.
		3	Definitions , Examples.
		4	Theorem 7.2,7.3
		5	Edge independent sets.
		6	Definitions , Examples.
2	19-07-2021 To 24-07-2021	7	Theorem
		20 July	**Bakrid- Holiday**
		8	Ramsey's Theorem
		9	Definitions , Examples.
		10	Theorem
		11	Class Test.
3	26-07-2021 To 31-07-2021	12	Ramsey's Graph.
		13	Definitions , Examples, Exercise Questions
		14	Theorem
		15	Theorem
		16	Definitions , Examples, Exercise Questions.
		17	Theorem
4	02-08-2021 To 07-08-2021	18	Shur's Theorem
		19	Class Test.
		20	Turan's Theorem
		21	Vertex Colorings-Introduction
		22	Definitions , Examples,Exercise Questions.
		23	Theorem
5	09-08-2021 To 14-08-2021	24	Chromatic Number- Definitions , Examples.
		25	Book's Theorem
		26	Definitions , Examples.
		27	Theorem
		28	Definitions , Examples, Exercise Questions
		29	Hajo's Conjecture
6	16-08-2021 To 21-08-2021	30	Chromatic Polynomials
		31	Girth and Chromatic Number
		32	Class Test.
		19 August	**Moharam/Onam Vacation**
		20 August	Onam Vacation

No of Weeks	Dates	Session	Topic
		21 August	Onam Vacation
7	23-08-2021 To 28-08-2021	23 August	Onam Vacation
		24 August	Onam Vacation
		25 August	Onam Vacation
		26 August	Onam Vacation
		27 August	Onam Vacation
		28 August	Onam Vacation
8	30-08-2021 To 04-09-2021	30 August	Onam Vacation
		33	Unit II- Introduction.
		34	Edge Colourings.
		35	Definitions , Examples, Exercise Questions.
		36	Theorem.
		37	Class Test.
9	06-09-2021 To 11-09-2021	38	Assignment.
		39	Edge Chromatic Number
			STUDY LEAVE
			STUDY LEAVE
			STUDY LEAVE
			STUDY LEAVE
10	13-09-2021 To 18-09-2021		STUDY LEAVE
			STUDY LEAVE
			I SEMESTER PG EXAMINATION
			I SEMESTER PG EXAMINATION
			I SEMESTER PG EXAMINATION
			I SEMESTER PG EXAMINATION
11	20-09-2021 To 25-09-2021		I SEMESTER PG EXAMINATION
		21 September	Sree Narayana Guru Samadhi
			I SEMESTER PG EXAMINATION
			I SEMESTER PG EXAMINATION
			I SEMESTER PG EXAMINATION
		40	Definitions , Examples, Exercise Questions
12	27-09-2021 To 02-10-2021	41	Theorem
		42	Theorem
		43	Vizing's Theorem
		44	Definitions , Examples, Exercise Questions
		45	Seminar.
		2 October	**Gandhi Jayanthi**
13	04-10-2021	46	The Timetabling Problem

No of Weeks	Dates	Session	Topic
	To 09-10-2021		Planar Graphs;
		47	Theorem.
		48	Class Test.
		49	Plane and Planar Graphs
		50	Definitions , Examples, Exercise Questions.
		51	Dual Graphs.
14	11-10-2021 To 16-10-2021	52	Definitions , Examples, Exercise Questions.
		53	Seminar.
		54	Euler's Formula- Theorem
		14 October	**Mahanavami**
		15 October	**Vijayadasami**
		55	Kuratowski's Theorem
15	18-10-2021 To 23-10-2021	56	Seminar.
		19 October	Milad-i-Sherif
		57	Non Hamiltonian Planar Graphs
		58	The Five Colour Theorem
		59	Theorem
		60	Class Test.
16	25-10-2021 To 30-10-2021	61	**INTERNAL EXAMINATION**
		62	**INTERNAL EXAMINATION**
		63	**INTERNAL EXAMINATION**
		64	**INTERNAL EXAMINATION**
		65	**INTERNAL EXAMINATION**
		66	Unit II- Introduction, ,
17	01-11-2021 To 06-11-2021	67	Matchings
		68	Definitions , Examples, Exercise Questions.
		69	Theorem
		4 November	Diwali
		70	Theorem
		71	Matchings and Coverings in bipartite Graphs
18	08-11-2021 To 13-11-2021	72	Definitions , Examples, Exercise Questions.
		73	Theorem
		74	Class Test.
		75	Perfect Matchings
		76	Theorem
		77	The Personnel Assignment Problem- Definitions , Examples, Exercise Questions
19		78	**INTERNAL EXAMINATION**

No of Weeks	Dates	Session	Topic
	15-11-2021 To 19-11-2021	79	**INTERNAL EXAMINATION**
		80	**INTERNAL EXAMINATION**
		81	**INTERNAL EXAMINATION**
		82	**INTERNAL EXAMINATION**
		83	Theorem
20	22-11-2021 To 26-11-2021	84	The Optimal Assignment Problem- Definitions , Examples, Exercise Questions.
		85	Theorem
		86	The Optimal Assignment Problem- Definitions , Examples, Exercise Questions.
		87	Networks.
		88	Separating sets, Class Test.
		89	Flows and Cuts,
21	29-11-2021 To 03-12-2021	90	Class Test.
			II SEMESTER PG EXAMINATION
			II SEMESTER PG EXAMINATION
			II SEMESTER PG EXAMINATION
			II SEMESTER PG EXAMINATION
			II SEMESTER PG EXAMINATION
22	06-12-2021 To 10-12-2021		**II SEMESTER PG EXAMINATION**
			II SEMESTER PG EXAMINATION