DON BOSCO ARTS & SCIENCE COLLEGE

ANGADIKADAVU

(Affiliated to Kannur University Approved by Government of Kerala)

ANGADIKADAVU P.O., IRITTY, KANNUR – 670706

COURSE PLAN

M Sc MATHEMATICS

(2019 – 21)

SEMESTER -III

ACADEMIC YEAR- (2020-21)

III Semester M Sc Mathematics (2019 - 21)			
SL. No.	**Name of Subjects with Code**	**Name of the Teacher**	**Duty Hours per week**
1.	**MAT3C11: Number Theory**	**Athulya K**	**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	**Ajeena Joseph**	

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
1	Graph theory	Functional Analysis	Number Theory	Complex Function theory	Advanced Real Analysis
2	Advanced Real Analysis	Complex Function Theory	Functional Analysis	Graph theory	Number Theory
3	Number Theory	Graph theory	Functional Analysis	Complex Function Theory	Advanced Real Analysis
4	Functional Analysis	Advanced Real Analysis	Complex Function Theory	Number Theory	Graph theory
5	Complex Function Theory	Functional Analysis	Number Theory	Graph theory	Advanced Real Analysis

Subject Code:	**MAT3C11**
Subject Name:	**Number Theory**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of the Teacher:	**Athulya P**

MAT3C11: NUMBER THEORY

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 μ(n)
–The Euler totient function ϕ (n) –The relation connecting μ and ϕ -the product formula for
ϕ (n) –The Dirichlet product of arithmetical functions- Dirichlet inverses and Mobius
inversion formula- The Mangolt function Λ(n) –Multiplicative functions- Multiplicative
functions and Dirichlet multiplication- The inverse of a completely multiplicative function-
Liouville's function λ(n)- The divisor function σα(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 α≥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	01-06-2020 To 05-06-2020	1	The Fundamental theorem of Arithmetic: Introduction
		2	Divisibility
		3	Greatest common divisor.
		4	Theorem
		5	Prime numbers

No of Weeks	Dates	Session	Topic
2	08-06-2020 To 12-06-2020	6	Fundamental theorem of arithmetic
		7	Theorem
		8	Theorem
		9	Arithmetical Functions and Dirichlet Multiplication:
		10	The Mobius function
3	15-06-2020 To 19-06-2020	11	Euler totient function
		12	Exam
		13	Theorem
		14	Product formula for Euler totient function
		15	Theorem
4	22-06-2020 To 26-06-2020	16	The Dirichlet Product of arithmetical Functions.
		17	Theorem
		18	Theorem
		19	Definition
		20	The Mobius inversion formula
5	29-06-2020 To 03-07-2020	21	The Mangoldt function
		22	Theorem
		23	Multiplicative function s
		24	Theorem
		03 July	St. Thomas Day
6	06-07-2020 To 10-07-2020	25	Multiplicative functions and Dirichlet Multiplication
		26	The inverse of a completely multiplicative function
		27	Theorem
		28	The divisor functions.
		29	Exam
7	13-07-2020 To 17-07-2020	30	Congruences .. properties
		31	Theorem
		32	Library hour
		33	Cancellation law
		34	Residue classes and complete residue system.
8	20-07-2020 To 24-07-2020	20 July	Karkkidaka Vavu
		35	Linear congruences
		36	Examples.
		37	Theorem
		38	Theorem , Reduced residue system
9	27-07-2020 To	39	Euler Fermat's theorem
		40	Theorem
		41	Applications of lagrange's theorem

No of Weeks	Dates	Session	Topic
	31-07-2020	42	Applications of the Chinese remainder theorem.
		31 July	Bakrid
10	03-08-2020 To 07-08-2020	43	Applications of the Chinese remainder theorem.
		44	Unit 2.Primitive Roots
		45	Primitive roots and reduced residue system
		46	Theorem
		47	The existence of primitive roots mod p for odd primes
11	10-08-2020 To 14-08-2020	48	Theorem
		49	Theorem
		50	Theorem
		51	Theorem
		52	Non existence of primitive roots
12	17-08-2020 To 21-08-2020	53	The number of primitive roots mod m.
		54	Exam
		55	Quadratic Residues and the Quadratic Reciprocity Law.
		56	Quadratic Residues and the Quadratic Reciprocity Law.
		57	Legendre's symbol and its properties
13	24-08-2020 To 28-08-2020	58	Evaluation of (-1□p) and (2 □p)
		59	Evaluation of (-1□p) and (2 □p)
		60	Gauss lemma
		61	The quadratic reciprocity law, Applications of the reciprocity law
		28 August	Ayyankali Jayanthi
14	31-08-2020 To 04-09-2020		Onam Holiday
			Onam Holiday
			Onam Holiday
			Onam Holiday
			Onam Holiday
15	07-09-2020 To 11-09-2020	62	Exam
		63	Jacobies symbol
		64	Applications to Diophantine equation.
		10 September	Sreekrishna Jayanthi
		65	Application of Diophantine equation
16	14-09-2020 To 18-09-2020	66	Algebraic Backgrounds: Symmetric polynomials
		67	Modules
		68	Modules

No of Weeks	Dates	Session	Topic
		69	free abelian groups
		70	free abelian groups
17	21-09-2020 To 25-09-2020	21 September	Sreenarayana Guru Samadhi
		71	Seminar
		72	Seminar
		73	Seminar
		74	Seminar
18	28-09-2020 To 02-10-2020	75	Seminar
		29 September	**Study Leave**
			Study Leave
			Study Leave
			Study Leave
19	05-10-2020 To 09-10-2020		**II Semester PG University Exam**
			II Semester PG University Exam
			II Semester PG University Exam
			II Semester PG University Exam
			II Semester PG University Exam
20	12-10-2020 To 17-10-2020	76	Algebraic Numbers: Algebraic numbers
		77	Conjugates and Discriminants
		78	Algebraic integers- Integral Algebraic Numbers
		79	Integral bases.
		80	theorem
		81	Norms and Traces
21	19-10-2020 To 24-10-2020	82	Rings of integers.
		83	Quadratic fields
		84	Quadratic fields
		85	Cyclotomic fields
		86	Cyclotomic fields
		87	Theorem
22	26-10-2020 To 30-10-2020		Vijayadasami
		88	Exam
		89	Revision
			Miladi-I-Sherif
		90	Revision
23	02-11-2020 To 06-11-2020		**Study Leave**
			Study Leave
			III Semester PG Internal Exams
			III Semester PG Internal Exams

No of Weeks	Dates	Session	Topic
			III Semester PG Internal Exams
24	09-11-2020 To 13-11-2020		**III Semester PG Internal Exams**
			III Semester PG Internal Exams
			Study Leave
			Study Leave
			Study Leave
25	16-11-2020 To 20-11-2020		**Study Leave**
			Study Leave
			Study Leave
			Study Leave
			Study Leave
26	23-11-2020		**University Exam III Semester PG Begins**

Subject Code:	**MAT3C12**
Subject Name:	**FUNCTIONAL ANALYSIS**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of the Teacher:	**Anil M V**

Syllabus

MAT3C12: FUNCTIONAL ANALYSIS

Text Book; Balmohan V Limaye; Functional Analysis (2nd Edition); New Age International
Publishers.

Unit I
Fundamentals of Normed Spaces; Normed Spaces, Banach spaces, Continuity of Linear
Maps, Hahn-Banach Theorems.
(Chapter-2, Sections 5,6,7,8)

Unit II
Bounded Linear Maps on Banach Spaces; Uniform Boundedness Principle, Closed Graph and Open Mapping Theorems, Bounded Inverse Theorem
(Chapter-3, Section 9, 10, 11, Omit 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, Section 21,22, 23, 24 (Omit 23.2, 23.6, 24.7, 24.8))

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	01-06-2020 To 05-06-2020	1	**Normed space: definition and results**
		2	**Examples of normed space**
		3	**Sequence spaces**
		4	**Jensen's inequality**
		5	**Theorem**
2	08-06-2020 To 12-06-2020	6	**Examples**
		7	**Function spaces**
		8	**Theorem**
		9	**Riesz lemma**
		10	**Theorem**
3	15-06-2020 To 19-06-2020	11	**Theorem**
		12	**Theorem**
		13	**Continuity of linear maps**
		14	**Theorem**
		15	**Theorem**
4	22-06-2020 To 26-06-2020	16	**Theorem**
		17	**Bounded linear maps**
		18	**Operator norm**
		19	**Theorem**
		20	**Theorem**
5	29-06-2020 To 03-07-2020	21	**Hahn Banach separation theorem**
		22	**Corollary**
		23	**Theorem**
		24	**Hahn Banach extension theorem**
		03 July	St. Thomas Day
6	06-07-2020 To 10-07-2020	25	**Banach spaces**
		26	**Examples**
		27	**Theorem**
		28	**Theorem**
		29	**Theorem**

No of Weeks	Dates	Session	Topic
7	13-07-2020 To 17-07-2020	30	**Examples**
		31	**Embedding a normed space**
		32	**Schauder basis definition**
		33	**Class test**
		34	**Introduction to bounded maps on Banach spaces**
8	20-07-2020 To 24-07-2020	20 July	Karkkidaka Vavu
		35	**Example**
		36	**Uniform boundedness principle**
		37	**Theorem**
		38	**Resonance theorem**
9	27-07-2020 To 31-07-2020	39	**Problems**
		40	**Theorem**
		41	**Closed map and continuous map**
		42	**Closed Graph theorem**
		31 July	Bakrid
10	03-08-2020 To 07-08-2020	43	**Class test**
		44	**Examples**
		45	**Projection maps**
		46	**Theorem**
		47	**Theorem**
11	10-08-2020 To 14-08-2020	48	**Class test**
		49	**Theorem**
		50	**Theorem**
		51	**Problem discussion**
		52	**Assignment**
12	17-08-2020 To 21-08-2020	53	**Theorem**
		54	**Theorem**
		55	**Theorem**
		56	**Problem discussion**
		57	**Class test**
13	24-08-2020 To 28-08-2020	58	**Open Mapping theorem**
		59	**Examples**
		60	**Bounded inverse theorem**
		61	**Two norm theorem**
		28 August	Ayyankali Jayanthi
14	31-08-2020 To		Onam Holiday
			Onam Holiday
			Onam Holiday

No of Weeks	Dates	Session	Topic
	04-09-2020		Onam Holiday
			Onam Holiday
15	07-09-2020 To 11-09-2020	62	**Inner product spaces**
		63	**Theorem**
		64	**Orthonormal sets**
		10 September	Sreekrishna Jayanthi
		65	**Assignment**
16	14-09-2020 To 18-09-2020	66	**Theorem**
		67	**Gram Schmidt orthonormalization**
		68	**Bessel's inequality**
		69	**Hilbert spaces and examples**
		70	**Theorem**
17	21-09-2020 To 25-09-2020	21 September	Sreenarayana Guru Samadhi
		71	**Theorem**
		72	**Theorem**
		73	**Theorem**
		74	**Best approximation**
18	28-09-2020 To 02-10-2020	75	**Theorem**
		29 September	**Study Leave**
			Study Leave
			Study Leave
			Study Leave
19	05-10-2020 To 09-10-2020		**II Semester PG University Exam**
			II Semester PG University Exam
			II Semester PG University Exam
			II Semester PG University Exam
			II Semester PG University Exam
20	12-10-2020 To 17-10-2020	76	**Seminar**
		77	**Seminar**
		78	**Seminar**
		79	**Seminar**
		80	**seminar**
		81	**Seminar**
21	19-10-2020	82	**Theorem**

No of Weeks	Dates	Session	Topic
	To 24-10-2020	83	**Theorem**
		84	**Projection and orthogonal projection**
		85	**Projection theorem**
		86	**Theorem**
		87	**Theorem**
22	26-10-2020 To 30-10-2020	26 October	Vijayadasami
		88	**Riesz Representation theorem**
		89	**Theorem**
		29October	Miladi-I-Sherif
		90	**Revision**
23	02-11-2020 To 06-11-2020		**Study Leave**
			Study Leave
			III Semester PG Internal Exams
			III Semester PG Internal Exams
			III Semester PG Internal Exams
24	09-11-2020 To 13-11-2020		**III Semester PG Internal Exams**
			III Semester PG Internal Exams
			Study Leave
			Study Leave
			Study Leave
25	16-11-2020 To 20-11-2020		**Study Leave**
			Study Leave
			Study Leave
			Study Leave
			Study Leave
26	23-11-2020		**University Exam III Semester PG Begins**

Subject Code:	**MAT3C13**
Subject Name:	**Complex function theory**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of the Teacher:	**Ajeena Joseph**

Syllabus

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′s theorem.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	01-06-2020 To 05-06-2020	1	Introduction to simply periodic functions
		2	Representation of exponetials
		3	The Fourier development
		4	Functions of finite orders
		5	Examples
2	08-06-2020 To 12-06-2020	6	Doubly periodic functions
		7	Period module
		8	Theorem 1
		9	Theorem 1
		10	Unimodular transformation
3	15-06-2020 To 19-06-2020	11	Class test
		12	Theorem 2
		13	Theorem 2
		14	General properties of elliptic functions
		15	Theorem 3
4	22-06-2020 To 26-06-2020	16	Theorem 4
		17	Theorem 5
		18	Theorem 6
		19	Class test
		20	The Weierstrass P function
5	29-06-2020 To 03-07-2020	21	Properties of Weierstrass P function
		22	Legender's relation
		23	Differential equations
		24	Reimann zeta function
		03 July	St. Thomas Day
6	06-07-2020 To 10-07-2020	25	Properties of Reimann zeta function
		26	Lemma 8.3
		27	Corollary 8.4
		28	Sigma function
		29	Proposition 8.5
7	13-07-2020	30	Reimann functional equation

No of Weeks	Dates	Session	Topic
	To 17-07-2020	31	Theorem 8.14
		32	Reimann hypothesis
		33	Euler′s theorem
		34	Class test
8	20-07-2020 To 24-07-2020	20 July	Karkkidaka Vavu
		35	Proposition 1.1
		36	Lemma 1.5
		37	Runge's theorem
		38	Lemma 1.8
9	27-07-2020 To 31-07-2020	39	Lemma 1.9
		40	Lemma 1.10
		41	Corollary 1.14
		42	Corollary 1.15
		31 July	Bakrid
10	03-08-2020 To 07-08-2020	43	Polynomially convex hull
		44	Homeomorphic sets
		45	Theorem 2.2
		46	Mittag- Leffler's theorem
		47	Mittag-Leffler′s theorem
11	10-08-2020 To 14-08-2020	48	Seminar
		49	Seminar
		50	Schwartz reflection principle
		51	Schwartz reflection principle
		52	Analytic continuation along a path
12	17-08-2020 To 21-08-2020	53	Analytic continuation along a path
		54	Class test
		55	Function element
		56	Proposition 2.4
		57	Lemma 3.1
13	24-08-2020 To 28-08-2020	58	Lemma 3.2
		59	Monodromy theorem
		60	Corollary 3.9
		61	Class test
		28 August	Ayyankali Jayanthi
14	31-08-2020 To 04-09-2020		Onam Holiday
			Onam Holiday
			Onam Holiday
			Onam Holiday

No of Weeks	Dates	Session	Topic
			Onam Holiday
15	07-09-2020 To 11-09-2020	62	Basic properties of harmonic function
		63	Proposition 1.3
		64	Mean value theorem
		10 September	Sreekrishna Jayanthi
		65	Maximum principle first version
16	14-09-2020 To 18-09-2020	66	Maximum principle second version
		67	Maximum principle second version
		68	Corollary 1.9
		69	Minimum principle
		70	Seminar
17	21-09-2020 To 25-09-2020	21 September	Sreenarayana Guru Samadhi
		71	Poisson kernel
		72	Proposition 2.3
		73	Theorem 2.4
		74	Corollary 2.9
18	28-09-2020 To 02-10-2020	75	Corollary 2.10, theorem 2.11
		29 September	**Study Leave**
			Study Leave
			Study Leave
			Study Leave
19	05-10-2020 To 09-10-2020		**II Semester PG University Exam**
			II Semester PG University Exam
			II Semester PG University Exam
			II Semester PG University Exam
			II Semester PG University Exam
20	12-10-2020 To 17-10-2020	76	Harnack' s inequality and Harnack′s theorem
		77	Sub- harmonic and super harmonic functions
		78	Maximum principle third version
		79	Class test
		80	Theorem3.2
		81	Maximum principle fourth version
21	19-10-2020	82	Theorem 3.4
		83	Corollary 3.5

No of Weeks	Dates	Session	Topic
	To 24-10-2020	84	Corollary 3.6 and 3.7
		85	Theorem 3.10
		86	Theorem 3.11
		87	Jensen's formula
22	26-10-2020 To 30-10-2020	26 October	Vijayadasami
		88	Class test
		89	Revision
		29October	Miladi-I-Sherif
		90	Revision
23	02-11-2020 To 06-11-2020		**Study Leave**
			Study Leave
			III Semester PG Internal Exams
			III Semester PG Internal Exams
			III Semester PG Internal Exams
24	09-11-2020 To 13-11-2020		**III Semester PG Internal Exams**
			III Semester PG Internal Exams
			Study Leave
			Study Leave
			Study Leave
25	16-11-2020 To 20-11-2020		**Study Leave**
			Study Leave
			Study Leave
			Study Leave
			Study Leave
26	23-11-2020		**University Exam III Semester PG Begins**

Subject Code:	**MAT3C14**
Subject Name:	**Advanced Real Analysis**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of the Teacher:	**Noble Philip**

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Syllabus

Unit I : Sequence and series of Functions: Discussion of Main Problem, Uniform Convergence, Uniform Convergence Continuity, Uniform Convergence and Integration, Uniform Convergence and Differentiation, Equicontinous Family of Functions, The Stone-Weierstrass TTheorem

(Chapter-7; Sections 7.1 to 7.33 and Theorem 7.33)

Unit ll : Some Special Functions; Power Series, The Exponential and Logarithmic Functions,The Trigonometric Functions, The Algebraic Completeness of the Complex Field,Fourier Series. The Gamma Function

(Chapter-8: Sections 8.1 to 8.22)

Unit III: Functions of Several Variables: Liner Transformations, Differentiation The Contraction Principle, The Inverse Function Theorem, The Implicit Function Theorem,

(Chater-9; Sections 9.1 to 9.29)

Textbook : Walter Rudin: Principles of Mathematical Analysis; (3rd Edition) Mc. Graw Hill, 1986.

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	01-06-2020 To 05-06-2020	1	Introduction to sequence of functions
		2	Example 7.2
		3	Example 7.3 and 7.4
		4	Example 7.5 and 7.6
		5	Uniform convergence
2	08-06-2020 To 12-06-2020	6	Theorem 7.8
		7	Theorem 7.9
		8	Theorem 7.10
		9	Class test
		10	Assignment
3	15-06-2020 To 19-06-2020	11	Uniform convergence and continuity
		12	Theorem 7.11
		13	Theorem 7.12
		14	Theorem 7.13
		15	Supremum norm
4	22-06-2020 To 26-06-2020	16	Assignment
		17	Theorem 7.15
		18	Theorem 7.16
		19	Class test
		20	Corollary
5	29-06-2020 To 03-07-2020	21	Theorem 7.17
		22	Theorem 7.18
		23	Pointwise bounded and uniformly bounded functions
		24	Example 7.20 and 7.21
		03 July	St. Thomas Day
6	06-07-2020 To 10-07-2020	25	Equicontinuous functions and theorem 7.23
		26	Theorem 7.24
		27	Theorem 7.25
		28	The stone Weierstrass theorem
		29	Theorem 7.29 and7.31

No of Weeks	Dates	Session	Topic
7	13-07-2020 To 17-07-2020	30	Theorem 7.32 and 7.33
		31	Theorem 8.1
		32	Theorem 8.2
		33	Theorem 8.3 and 8.4
		34	Theorem 8.5
8	20-07-2020 To 24-07-2020	20 July	Karkkidaka Vavu
		35	Introduction to exponetial and logarithmic functions
		36	Theorem 8.6
		37	Theorem 8.6
		38	Properties of logarithmic functions
9	27-07-2020 To 31-07-2020	39	Theorem 8.7 and 8.8
		40	Theorem 8.11
		41	Trigonometric series
		42	Theorem 8.14
		31 July	Bakrid
10	03-08-2020 To 07-08-2020	43	Class test
		44	Theorem 8.15
		45	Theorem 8.16 Parseval's theorem
		46	Theorem 8.16
		47	Assignment
11	10-08-2020 To 14-08-2020	48	The gamma fumction
		49	Theorem 8.18
		50	Theorem 8.19
		51	Class test
		52	Seminar
12	17-08-2020 To 21-08-2020	53	Seminar
		54	Seminar
		55	Theorem 8.20
		56	Theorem 8.20
		57	Properties of gamma function
13	24-08-2020 To 28-08-2020	58	Stiriling's formula
		59	Assignment
		60	Class test
		61	Theorem 9.2
		28 August	Ayyankali Jayanthi
14	31-08-2020 To		Onam Holiday
			Onam Holiday
			Onam Holiday

No of Weeks	Dates	Session	Topic
	04-09-2020		Onam Holiday
			Onam Holiday
15	07-09-2020 To 11-09-2020	62	Theorem 9.3
		63	Theorem 9.5
		64	Theorem 9.7 and 9.8
		10 September	Sreekrishna Jayanthi
		65	Library hour
16	14-09-2020 To 18-09-2020	66	Derivatives
		67	Theorem 9.12
		68	Class test
		69	Example 9.14
		70	Theorem 9.15
17	21-09-2020 To 25-09-2020	21 September	Sreenarayana Guru Samadhi
		71	Theorem 9.16
		72	Theorem 9.16
		73	Theorem 9.17
		74	Theorem 9.17
18	28-09-2020 To 02-10-2020	75	Seminar
		29 September	**Study Leave**
			Study Leave
			Study Leave
			Study Leave
19	05-10-2020 To 09-10-2020		**II Semester PG University Exam**
			II Semester PG University Exam
			II Semester PG University Exam
			II Semester PG University Exam
			II Semester PG University Exam
20	12-10-2020 To 17-10-2020	76	Example 9.18
		77	Theorem 9.19
		78	Theorem 9.21
		79	Theorem 9.21
		80	Theorem 9.22
		81	Contraction
21	19-10-2020	82	Theorem 9.24

No of Weeks	Dates	Session	Topic
	To 24-10-2020	83	Theorem 9.24
		84	Theorem 9.25
		85	Theorerm 9.26
		86	The implicit function theorem
		87	The implicit function theorem
22	26-10-2020 To 30-10-2020	26 October	Vijayadasami
		88	Class test
		89	Revision
		29October	Miladi-I-Sherif
		90	Revision
23	02-11-2020 To 06-11-2020		**Study Leave**
			Study Leave
			III Semester PG Internal Exams
			III Semester PG Internal Exams
			III Semester PG Internal Exams
24	09-11-2020 To 13-11-2020		**III Semester PG Internal Exams**
			III Semester PG Internal Exams
			Study Leave
			Study Leave
			Study Leave
25	16-11-2020 To 20-11-2020		**Study Leave**
			Study Leave
			Study Leave
			Study Leave
			Study Leave
26	23-11-2020		**University Exam III Semester PG Begins**

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

Syllabus:

Unit I: Independence and Cliques; Independent sets, Ramsey theorem, Turan' s theorem, Schur's theorem.
Vertex colouring: Chromatic number, Brook′s s theorem, Hajos conjecture, Chromatic polynomials, Girth and chromatic number.
(chapter 7 (except section 7.5), chapter 8 (except section 8.6) of text 1)

Unit II: Edge colouring; 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- Hamilton planar graphs. (Chapter 6 (all sections), chapter 9 (except section 9.8) of text 1).

Unit III: 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 and 5.5) of text 1.)
Networks: Flows and cuts, separating sets.(Chapter 8 (sections 8.1 and 8.3) of text 2)

Text 1: J.A Bondy and U.S Murty, Graph theory and applications
Text 2: John Clark and Derek Allan Holtan, A first look at graph theory

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	01-06-2020 To 05-06-2020	1	Independent sets
		2	Examples
		3	Theorem 7.1 and Corollary
		4	Theorem 7.2 and Corollary
		5	Introduction to matching in graphs
2	08-06-2020 To 12-06-2020	6	Examples to explain matching
		7	Independence number and edge covering number
		8	Theorem 7.4
		9	Theorem 7.5
		10	Assignment
3	15-06-2020 To 19-06-2020	11	Class test
		12	Ramsey number
		13	Ramsey theorem
		14	Different Ramsey numbers
		15	Theorem 7.6
4	22-06-2020 To 26-06-2020	16	Theorem 7.7
		17	Theorem 7.7
		18	Turan′s theorem
		19	Theorem 7.8
		20	Schur's theorem
5	29-06-2020 To 03-07-2020	21	Chromatic number
		22	Introduction to clique, critical graph and block
		23	Theorem 8.1 and Corollary
		24	Dirac theorem
		03 July	St. Thomas Day
6	06-07-2020 To 10-07-2020	25	Brook's theorem
		26	Brook′s theorem
		27	Hajos conjecture
		28	Class test
		29	Chromatic polynomials
7	13-07-2020 To	30	Girth and chromatic number
		31	K- chromatic number
		32	Introduction to edge colouring , k- edge colouring

No of Weeks	Dates	Session	Topic
	17-07-2020	33	Lemma 6.1.1
		34	Lemma 6.1.2
8	20-07-2020 To 24-07-2020	20 July	Karkkidaka Vavu
		35	Theorem 6.1
		36	Vizing's theorem
		37	Timetabling problem
		38	Timetabling problem
9	27-07-2020 To 31-07-2020	39	Class test
		40	Lemma 6.3
		41	Theorem 6.3
		42	Plane and planar graphs
		31 July	Bakrid
10	03-08-2020 To 07-08-2020	43	Examples
		44	Theorem 9.1
		45	Theorem 9.2
		46	Dual graphs and theorem 9.3
		47	Theorem 9.4
11	10-08-2020 To 14-08-2020	48	Seminar
		49	Seminar
		50	Euler's theorem
		51	Theorem 9.5
		52	Corollary 9.5.1, 9.5.2
12	17-08-2020 To 21-08-2020	53	Corollary 9.5.3, 9.5.4
		54	Introduction to bridges and theorem 9.6
		55	Theorem 9.7, 9.8
		56	Seminar
		57	Kuratowski's theorem
13	24-08-2020 To 28-08-2020	58	Class test
		59	4 colour theorem and 5 colour theorem
		60	Non Hamiltonian plane graph
		61	Matching and maximum matching
		28 August	Ayyankali Jayanthi
14	31-08-2020 To 04-09-2020		Onam Holiday
			Onam Holiday
			Onam Holiday
			Onam Holiday
			Onam Holiday

No of Weeks	Dates	Session	Topic
15	07-09-2020 To 11-09-2020	62	Theorem 5.2 and Corollary 5.2
		63	Lemma 5.3
		64	Perfect matching and examples
		10 September	Sreekrishna Jayanthi
		65	Assignment
16	14-09-2020 To 18-09-2020	66	Theorem 5.4
		67	Theorem 5.4
		68	Corollary 5.4
		69	Personnel assignment problem
		70	Personnel assignment problem
17	21-09-2020 To 25-09-2020	21 September	Sreenarayana Guru Samadhi
		71	Hungarian algorithm
		72	Hungarian algorithm
		73	Class test
		74	Theorem 5.5
18	28-09-2020 To 02-10-2020	75	Kuhn Munkers algorithm
		29 September	**Study Leave**
			Study Leave
			Study Leave
			Study Leave
19	05-10-2020 To 09-10-2020		**II Semester PG University Exam**
			II Semester PG University Exam
			II Semester PG University Exam
			II Semester PG University Exam
			II Semester PG University Exam
20	12-10-2020 To 17-10-2020	76	Flows and cuts
		77	Flows and cuts
		78	Networks
		79	Theorem 8.1
		80	Theorem
		81	Theorem 8.1 and 8.2
21	19-10-2020 To 24-10-2020	82	Separating sets
		83	Seminar
		84	Seminar
		85	Theorem

No of Weeks	Dates	Session	Topic
		86	Menger' s theorem
		87	Manger's theorem (edge version)
22	26-10-2020 To 30-10-2020	26 October	Vijayadasami
		88	Revision
		89	Revision
		29October	Miladi-I-Sherif
		90	Revision
23	02-11-2020 To 06-11-2020		**Study Leave**
			Study Leave
			III Semester PG Internal Exams
			III Semester PG Internal Exams
			III Semester PG Internal Exams
24	09-11-2020 To 13-11-2020		**III Semester PG Internal Exams**
			III Semester PG Internal Exams
			Study Leave
			Study Leave
			Study Leave
25	16-11-2020 To 20-11-2020		**Study Leave**
			Study Leave
			Study Leave
			Study Leave
			Study Leave
26	23-11-2020		**University Exam III Semester PG Begins**