DON BOSCO ARTS & SCIENCE COLLEGE

ANGADIKADAVU

(Affiliated to Kannur University Approved by Government of Kerala)

ANGADIKADAVU P.O., IRITTY, KANNUR – 670706

COURSE PLAN

MSc MATHEMATICS

(2018 – 20)

SEMESTER -III

ACADEMIC YEAR –(2019–20)

III Semester MSc MATHEMATICS (2018 - 20)			
SL. No.	**Name of Subjects with Code**	**Name of the Teacher**	**Duty Hours per week**
1.	MAT 3C 11 Number Theory	Najumunnisa.K	5
2.	MAT 3C 12 Functional Analysis	Athulya.P	5
3.	MAT 3C 13Complex FunctionTheory	Ajeena Joseph	5
4.	MAT 3C 14 Advanced Real Analysis	Noble Philip	5
5.	MAT 3E 01 Graph Theory	Prija V.	5
6.			
7.			
	Class In-charge	**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	03.30 Pm- 04.30 Pm
1	MAT 3C 11 Number Theory	MAT 3E 01 Graph Theory	MAT 3C 12 Functional Analysis	MAT 3C 13Complex FunctionTheory	MAT 3C 12 Functional Analysis	MAT 3C 11 Number Theory
2	MAT 3C 12 Functional Analysis	MAT 3C 11 Number Theory	MAT 3C 14 Advanced Real Analysis	MAT 3E 01 Graph Theory	MAT 3C 13Complex Function Theory	MAT 3C 14 Advanced Real Analysis
3	MAT 3C 14 Advanced Real Analysis	MAT 3C 11 Number Theory	MAT 3C 13Complex Function Theory	MAT 3C 14 Advanced Real Analysis	MAT 3E 01 Graph Theory	MAT 3C 12 Functional Analysis
4	MAT 3E 01 Graph Theory	MAT 3C 14 Advanced Real Analysis	MAT 3C 11 Number Theory	MAT 3C 12 Functional Analysis	MAT 3C 13Complex Function Theory	MAT 3C 14 Advanced Real Analysis
5	MAT 3C 13Complex Function Theory	MAT 3C 11 Number Theory	MAT 3E 01 Graph Theory	MAT 3C 12 Functional Analysis	MAT 3C 13Complex Function Theory	MAT 3E 01 Graph Theory

Subject Code:	**MAT 3C 11**
Subject Name:	**Number Theory**
No. of Credits:	**5**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of Faculty	**Najumunnisa.K**

Unit I

The Fundamental theorem of Arithmetic: Introduction-Divisibility-Greatest divisorprimenumbers common - Th Introduction-Divisibility e 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 forϕ (n) –The Dirichlet product of arithmetical functions- Dirichlet inverses and Mobiusinversion 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 completeresidue system- Liner Congruences-Reduced residue system and the Euler-Fermat theorem-Polynomial congruences modulo *P* and LaGrange's theorem-Applications of Langrange'stheorem- Simultaneous linear congruences and Chinese Remainder theorem- Applications ofChinese 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'ssymbol and its **Quadratic Residues** - Evaluation of (-1□*p*) and (2 □*p*) Gauss lemma-The quadraticreciprocity law –Applications of the reciprocity law – The Jacobi symbol- Applications toDiophantine equations.(Text 1, Sections 9.1 –9.8)

Primitive Roots: The exponent of number mod *m* and primitive roots- Primitive roots andreduced residu; system- The nonexistence of primitive roots mod 2a for α≥3- The existenceof primitive roots mod *p* for odd primes *p*- Primitive roots and quadratic residues – Theexistence of primitive roots and *P*a- The existence of primitive roots mod 2 *P*a –Thenonexistence 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-TheKnapsack 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)

Text Book:

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

Reference:

1. G.H Hardy and E.M Wright: An introduction to the theory of numbers,Oxford University Press.
2. I Niven, H.S Zuckerman, H.L Montgomery; An Introduction to the theoryof numbers, Wiley India
3. Emil Grosswald: Introduction to number theory.
4. P.Samuel; Theory of Algebraic Numbers, Herman Paris Haughton Mifflin
5. S.Lang Algebraic Number Theory Addison Wesley Pub. Co Reading.

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	06-06-2019 To 07-06-2019	1	The Fundamental theorem of Arithmetic
		2	Introduction-Divisibility
		3	-Greatest Common divisors
2	10-06-2019 To 14-06-2019	4	Theorems
		5	fundamental theorem of arithemetic
		6	Theorems Theorems
		7	The Euclidean algorithm
		8	The greatest common divisor of more than two numbers
		9	Theorems
		10	Introduction- The Mobius function
3	17-06-2019 To 21-06-2019	11	Theorems
		12	The Euler totient function ϕ (n) –
		13	The relation connecting μ and ϕ
		14	The product formula forϕ (n)
		15	The Dirichlet product of arithmetical functions
		16	Dirichlet inverses and Mobiusinversion formula
		17	Class Test
4	24-06-2019 To 28-06-2019	18	The Mangolt function Λ(n) –Multiplicative Inverses
		19	Theorems
		20	Multiplicative functions and Dirichlet function
		21	Liouville's function λ(n)- The divisor function
		22	Definition and basic properties of congruences
		23	Residue classes and completeresidue system
		24	Liner Congruences-Reduced residue system
5	01-07-2019 To 05-07-2019	25	Euler -Fermat theorem-Polynomial congruences modulo*P*
		26	LaGrange's theorem and its application
		03 July	St.Thomas Day
		27	Chines Remainder theorem
		28	Applications ofChinese remainder theorem
		29	Polynomial congruences with prime power moduli.
		30	Class Test
6	08-07-2019 To	31	**Quadratic Residues**
		32	Theorems
		33	Theorems
		34	Evaluation of (-1□*p*) and (2 □*p*)

No of Weeks	Dates	Session	Topic
	12-07-2019	35	Gauss lemma
		36	Applications of the reciprocity law
		37	Theorems
		38	The quadraticreciprocity law
7	15-07-2019 To 19-07-2019	39	Theorems
		40	The Jacobi symbol
		42	Applications toDiophantine equations
		43	The exponent of number mod *m* and primitive roots
		44	The nonexistence of primitive roots mod 2a for $\alpha \geq 3$
		45	Theorems Theexistence of primitive roots and *P*a
		46	Primitive roots and quadratic residues
8	22-07-2019 To 26-07-2019	**22 July**	**First Internal Exam**
			First Internal Exam
			First Internal Exam
			First Internal Exam
			First Internal Exam
9	29-07-2019 To 02-08-2019	47	Theorems
		48	Theorems
		49	Class Test
		31 July	**KarkadakaVavu**
		50	Theexistence of primitive roots and *P*a
		51	Thenonexistence of Primitive roots in the remaining cases
		52	Discussion
		53	From Caesar Cipher to Public Key Cryptography
10	05-08-2019 To 09-08-2019	54	Discussion
		55	Theorems
		56	An application of primitive roots to Cryptography.
		57	Theorems
		58	Question Paper Discussion
		59	Class Test
		60	Symmetric polynomials-
11	12-08-2019 To 16-08-2019	61	Theorems
		62	modules
		15 Aug	**Independence day**
		63	free abelian groups
		64	Theorems
		65	Algebraic numbers

No of Weeks	Dates	Session	Topic
12	19-08-2019 To 23-08-2019	66	Theorems
		67	Theorems
		68	Conjugates and Discriminants
		69	Theorems
		70	Algebraic integer
		71	Integral bases
		23 Aug	SreekrishnaJayanthi
13	26-08-2019 To 30-08-2019	72	Class Test
		73	Theorems
		28 Aug	AyyankaliJayanthi
		74	Norms and Traces
		75	Theorems
		76	Rings of integers
		77	Theorems
14	02-09-2019 To 06-09-2019	78	Discussion
		79	Discussion
		80	Quadratic and Cyclotomic fields
		81	Theorems
		82	Theorems
		83	Seminar
			Onam Celebration
15	09-09-2019 To 13-09-2019		Muharram
			First Onam
			Thiruvonam
			Third Onam
			Fourth Onam - SreeNarayana Guru Jayanthi
16	16-09-2019 To 20-09-2019	84	Seminar
		85	Seminar
		86	Seminar
		87	Seminar
		88	Seminar
		89	Question Paper Discussion
		90	Class Test
17	23-09-2019 To 27-09-2019	23 Sep	**Second Internal**
			Second Internal
			Second Internal
			Second Internal
			Second Internal

No of Weeks	Dates	Session	Topic
18	30-09-2019 To 04-10-2019		Study Leave
			Study Leave
		2 Oct	Gandhi Jayanthi
			Study Leave
			Study Leave
			Study Leave
19	07-10-2019 To 11-10-2019	07 Oct	Mahanavami
		08 Oct	Vijayadashami
		09 Oct	University Exam Begin

Subject Code:	**MAT 3C 12**
Subject Name:	**Functional Analysis**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of Faculty	**Athulya.P**

Unit I

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

Unit II

Bounded Linear Maps on Banach Spaces; Uniform Boundedness Principle, Closed Graphand Open Mapping Theorems, Bounded Inverse Theorem(Chapter-3, Section 9, 10, 11, Omit Quadrature Formula and Matrix Transformation andSummability Methods of Section 9)

Unit III

Geometry of Hilbert Spaces; Inner Product Spaces, Orthonormal Sets.Approximation andOptimization, Projection and Riesz Representation Theorems.(Chapter-6, Section 21,22, 23, 24 (Omit 23.2, 23.6, 24.7, 24.8))

Text Book;

Balmohan V Limaye; Functional Analysis (2nd Edition); New Age InternationalPublishers.

Reference:

1. E.Kreyszig; Introductory Functional Analysis with Applications, JohnWiley
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 HillInternational 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	06-06-2019 To 07-06-2019	1	Module I-Fundamentals of Normed Spaces
		2	Normed Spaces-Definition
		3	Properties of Normed spacces
2	10-06-2019 To 14-06-2019	4	Properties of Normed spacces
		5	Examples
		6	Examples
		7	Theorem
		8	Theorem
		9	Lemma
		10	Lemma
3	17-06-2019 To 21-06-2019	11	Lemma
		12	Theorem
		13	Theorem
		14	Theorem
		15	Theorem
		16	Continuity of Linear maps
		17	Theorem
4	24-06-2019 To 28-06-2019	18	Theorem
		19	Theorem
		20	Class-Test
		21	Seminar
		22	Seminar
		23	Seminar
		24	Examples.
5	01-07-2019 To 05-07-2019	25	Examples.
		26	Bounded Linear Maps
		03 July	St.Thomas Day
		27	Theorem
		28	Hahn-Banach Theorems
		29	Lemma
		30	Lemma
6	08-07-2019	31	Theorem
		32	Lemma
		33	Hahn-Banach separation theorem

No of Weeks	Dates	Session	Topic
	To 12-07-2019	34	Corollary
		35	Lemma
		36	Hahn-Banach extension theorem
		37	Examples
		38	Theorem
7	15-07-2019 To 19-07-2019	39	Unique Hahn-Banach extension-Theorem
		40	Banach limits- Theorem
		42	Banach spaces-Examples
		43	Theorem
		44	Theorem
		45	Theorem
		46	Theorem
8	22-07-2019 To 26-07-2019	**22 July**	**First Internal Exam**
			First Internal Exam
			First Internal Exam
			First Internal Exam
			First Internal Exam
			First Internal Exam
9	29-07-2019 To 02-08-2019	47	Module II-Bounded Linear Maps on Banach Spaces; Uniform Boundedness Principle
		48	Theorem
		49	Theorem
		31 July	**KarkadakaVavu**
		50	Corollary
		51	Theorem
		52	Theorem
		53	Closed Graphand Open Mapping Theorems
10	05-08-2019 To 09-08-2019	54	Lemma
		55	Closed GraphTheorem
		56	Theorem
		57	Theorem
		58	Theorem
		59	Theorem
		60	Open Mapping Theorem
11	12-08-2019 To 16-08-2019	61	Examples.
		62	Examples.
		15 Aug	**Independence day**
		63	Class-test

No of Weeks	Dates	Session	Topic
		64	Bounded Inverse Theorem
		65	Theorem
12	19-08-2019 To 23-08-2019	66	Mpdule III-Geometry of Hilbert Spaces
		67	Seminar
		68	Seminar
		69	Seminar
		70	Seminar
		71	Seminar
		23 Aug	SreekrishnaJayanthi
13	26-08-2019 To 30-08-2019	72	Seminar
		73	Seminar
		28 Aug	AyyankaliJayanthi
		74	Seminar
		75	Seminar
		76	Seminar
		77	Examples
14	02-09-2019 To 06-09-2019	78	Approximation andOptimization,
		79	Theorem
		80	Theorem
		81	Theorem
		82	Theorem
		83	Examples
			Onam Celebration
15	09-09-2019 To 13-09-2019		Muharram
			First Onam
			Thiruvonam
			Third Onam
			Fourth Onam - SreeNarayana Guru Jayanthi
16	16-09-2019 To 20-09-2019	84	Projection and Riesz Representation Theorems
		85	Projection Theorem
		86	Theorem
		87	Class-Test
		88	ModuleI-Revision
		89	ModuleII-Revision
		90	ModuleIII-Revision
17	23-09-2019 To	23 Spt	**Second Internal**
			Second Internal
			Second Internal

No of Weeks	Dates	Session	Topic
	27-09-2019		Second Internal
			Second Internal
18	30-09-2019 To 04-10-2019		Study Leave
			Study Leave
		2 Oct	Gandhi Jayanthi
			Study Leave
			Study Leave
			Study Leave
19	07-10-2019 To 11-10-2019	07 Oct	Mahanavami
		08 Oct	Vijayadashami
		09 Oct	University Exam Begin

Subject Code:	**MAT 3C 13**
Subject Name:	**Complex Function Theory**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of Faculty	**Ajeena Joseph**

Unit I

Elliptic Functions: Simple periodic functions, Doubly periodic functions, The WeierstrassTheory. (Chapter 7, Sections 1, 2, 3 of Text 1)The Riemann Zeta function (Chapter 7, Sections 8 of Text 2)

Unit II

Runge's Theorem: Runge's Theorem, Simple Connectedness, MittagLefler's Theorem.Analytic Continuation and Riemann Surfaces: Schwarz Reflection Principle, AnalyticContinuation along a path, Mondromy Theorem(Chapter VIII, Section 1, 2, 3, of text 2; IX Section 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 X, Sections 1,2,3 ; Chapter XI, Sections 1 of Text 2)

Text Book

1: Lars V Ahlfors -Complex Analysis (3rd Edition), McGraw-Hill Education

2: John B Conway - Functions of One Complex Variable, 2nd Edition, SpringerInternational Student Edition

References:

1. Louis Pennise: Elements of Complex Variable, Holt, Rinehart and Winston; 2nd edition (July1976)

2. Silverman: Complex Variable, Haughton Miffin Boston 1975.

3. Rudin.W: Real and Complex Analysis (3rd Edition) McGraw Hill International Edition 1967.

4. T Copson: An Introduction to the Theory of a Complex Variables, Oxford University Press1974.

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	06-06-2019 To 07-06-2019	1	Introduction
		2	Periodic functions
		3	Simple periodic functions
2	10-06-2019 To 14-06-2019	4	Examples
		5	Doubly periodic functions
		6	Class Test
		7	Theorems
		8	Theorems
		9	The Weierstrass Theory - introduction
		10	Different weierstrass functions and properties
3	17-06-2019 To 21-06-2019	11	Different weierstrass functions and properties
		12	Examples
		13	Examples
		14	Theorems
		15	Problems
		16	Problems
		17	Theorems
4	24-06-2019 To 28-06-2019	18	Theorems
		19	Class Test
		20	Order of different functions
		21	Theorems
		22	Examples
		23	Theorems
		24	Theorems
5	01-07-2019 To 05-07-2019	25	Weierstrass zeta function
		26	Examples
		03 July	St.Thomas Day
		27	Assignment
		28	Exercise problems
		29	Theorems
		30	Theorems
6	08-07-2019 To	31	Relationship between Weierstrass function and Riemann zeta function
		32	examples
		33	Reimann hypothesis

No of Weeks	Dates	Session	Topic
	12-07-2019	34	Euler's theorem
		35	Exercise problems
		36	Question paper discussion
		37	Discussion (Cauchy's theorems)
		38	Proposition
7	15-07-2019 To 19-07-2019	39	Proposition
		40	Lemma
		42	Theorem
		43	Runge's Theorem
		44	Runge's Theorem
		45	Runge's Theorem
		46	Class Test
8	22-07-2019 To 26-07-2019	22 July	First Internal Exam
			First Internal Exam
			First Internal Exam
			First Internal Exam
			First Internal Exam
			First Internal Exam
9	29-07-2019 To 02-08-2019	47	Corollary
		48	Corollary
		49	Theorem
		31 July	KarkadakaVavu
		50	Polynomially convex hull
		51	Examples
		52	Simple Connectedness
		53	Simple Connectedness
10	05-08-2019 To 09-08-2019	54	MittagLefler's Theorem
		55	MittagLefler's Theorem
		56	Theorem
		57	Analytic Continuation
		58	Analytic Continuation
		59	Analytic Continuation along a path
		60	Analytic Continuation along a path
11	12-08-2019 To 16-08-2019	61	Analytic Continuation along a path
		62	Schwarz Reflection Principle
		15 Aug	Independence day
		63	Schwarz Reflection Principle
		64	Monodromy theorem

No of Weeks	Dates	Session	Topic
		65	Monodromy theorem
12	19-08-2019 To 23-08-2019	66	Question paper discussion
		67	Class Test
		68	Introduction to harmonic functions
		69	Harmonic functioms on adisk
		70	Harmonic functioms on adisk
		71	Theorems
		23 Aug	SreekrishnaJayanthi
13	26-08-2019 To 30-08-2019	72	Theorems
		73	Sub harmonic functions
		28 Aug	AyyankaliJayanthi
		74	Theorems
		75	Theorems
		76	Super harmonic functions
		77	Super harmonic functions
14	02-09-2019 To 06-09-2019	78	Super harmonic functions
		79	Theorem
		80	Entire Functions
		81	Theorems
		82	Theorems
		83	Assignment
			Onam Celebration
15	09-09-2019 To 13-09-2019		Muharram
			First Onam
			Thiruvonam
			Third Onam
			Fourth Onam - SreeNarayana Guru Jayanthi
16	16-09-2019 To 20-09-2019	84	Theorem
		85	Jensson's formula
		86	Seminar
		87	Seminar
		88	Class Test
		89	Revision
		90	Revision
17	23-09-2019 To 27-09-2019	23 Spt	Second Internal
			Second Internal
			Second Internal
			Second Internal

No of Weeks	Dates	Session	Topic
			Second Internal
18	30-09-2019 To 04-10-2019		Study Leave
			Study Leave
		2 Oct	Gandhi Jayanthi
			Study Leave
			Study Leave
			Study Leave
19	07-10-2019 To 11-10-2019	07 Oct	Mahanavami
		08 Oct	Vijayadashami
		09 Oct	University Exam Begin

Subject Code:	**MAT 3C 14**
Subject Name:	**Advanced Real Analysis**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of Faculty	**Noble Philip**

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Unit I

Sequence and series of Functions: Discussion of Main Problem, Uniform Convergence,Uniform Convergence and Continuity, Uniform Convergence and Integration, Uniform Convergence and Differentiation, Equicontinous Family of Functions, The Stone-Weierstrass Theorem,(Chapter-7; Sections 7.1 to 7.33 and Theorem 7.33)

Unit II

Some Special Functions; Power Series, The Exponential and Logarithmic Functions, TheTrigonometric 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 ContractionPrinciple, The Inverse Function Theorem, The Implicit Function Theorem,(Chater-9; Sections 9.1 to 9.29)

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

Reference:

1. R.G Bartle and D.R Sherbert; Introduction to Real Analysis; John WileyBros. 1982
2. L.M Graves; The Theory of Functions of a Real Variable; Tata McGraw-Hill Book Co 1978
3. M.H Protter and C.B Moray; A First course in Real Analysis; SpringerVerlag UTM 1977
4. T.M Apostol; Mathematical Analysis; 2nd Edition; Narosa Publications1973.

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	06-06-2019 To 07-06-2019	1	Introduction
		2	Sequence and series of Functions
		3	Pointwise convergence
2	10-06-2019 To 14-06-2019	4	Pointwise convergence
		5	Examples
		6	Interchange of limit
		7	Examples
		8	Examples
		9	Formal Definition of pointwise convergence.
		10	Discussion of Main Problem
3	17-06-2019 To 21-06-2019	11	Uniform convergence
		12	Cauchy criterion for uniform convergence
		13	Theorem
		14	Definition
		15	Weierstrass-M Test
		16	Examples
		17	Examples
4	24-06-2019 To 28-06-2019	18	Examples
		19	Assignment
		20	Uniform Convergence and Continuity
		21	Theorem
		22	Theorem
		23	Definition
		24	Theorem
5	01-07-2019 To 05-07-2019	25	Theorem
		26	Class test
		03 July	St. Thomas Day
		27	Uniform Convergence and Integration
		28	Theorem
		29	Corollary
		30	Uniform Convergence and Differentiation
6	08-07-2019 To	31	Theorem
		32	Theorem
		33	Theorem
		34	Examples

No of Weeks	Dates	Session	Topic
	12-07-2019	35	Assignment
		36	Equicontinous Family of Functions
		37	Pointwise Bounded
		38	**Uniform Bounded**
7	15-07-2019 To 19-07-2019	39	Examples
		40	Examples
		42	Class test
		43	Equicontinous Functions
		44	Theorem
		45	Theorem
		46	The Stone-Weierstrass Theorem
8	22-07-2019 To 26-07-2019	**22 July**	**First Internal Exam**
			First Internal Exam
			First Internal Exam
			First Internal Exam
			First Internal Exam
			First Internal Exam
9	29-07-2019 To 02-08-2019	47	Introduction
		48	Some Special Functions
		49	Theorem
		31 July	**KarkadakaVavu**
		50	Theorem
		51	Theorem
		52	Power Series
		53	Examples
10	05-08-2019 To 09-08-2019	54	The Exponential and Logarithmic Functions
		55	The Exponential and Logarithmic Functions
		56	Theorem
		57	Theorem
		58	The Trigonometric Functions
		59	The Algebraic Completeness of the Complex Field
		60	The Algebraic Completeness of the Complex Field
11	12-08-2019 To 16-08-2019	61	Assignment
		62	Class test
		15 Aug	**Independence day**
		63	Fourier Series
		64	Examples
		65	The Gamma Function

No of Weeks	Dates	Session	Topic
12	19-08-2019 To 23-08-2019	66	Examples
		67	Theorem
		68	Theorem
		69	Theorem
		70	Class test
		71	Introduction
		23 Aug	SreekrishnaJayanthi
13	26-08-2019 To 30-08-2019	72	Functions of Several Variables
		73	Functions of Several Variables
		28 Aug	AyyankaliJayanthi
		74	Theorem
		75	Theorem
		76	Inverse function theorem
		77	Liner Transformations
14	02-09-2019 To 06-09-2019	78	Theorem
		79	Examples
		80	Differentiation
		81	Partial Derivatives
		82	Theorem
		83	Assignment
			Onam Celebration
15	09-09-2019 To 13-09-2019		Muharram
			First Onam
			Thiruvonam
			Third Onam
			Fourth Onam - SreeNarayana Guru Jayanthi
16	16-09-2019 To 20-09-2019	84	Examples
		85	The Contraction Principle
		86	Examples
		87	Assignment
		88	The Inverse Function Theorem
		89	The Implicit Function Theorem
		90	Class test
17	23-09-2019 To 27-09-2019	23 Spt	Second Internal
			Second Internal
			Second Internal
			Second Internal
			Second Internal

No of Weeks	Dates	Session	Topic
18	30-09-2019 To 04-10-2019		Study Leave
			Study Leave
		2 Oct	Gandhi Jayanthi
			Study Leave
			Study Leave
			Study Leave
19	07-10-2019 To 11-10-2019	07 Oct	Mahanavami
		08 Oct	Vijayadashami
		09 Oct	University Exam Begin

Subject Code:	**MAT 3E 01**
Subject Name:	**Graph Theory**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of Faculty	**Prija V.**

Unit I

Independent Sets and Cliques; Independent Sets, Ramsey's Theorem, Turan's Theorem,Shur's TheoremVertex Colorings: Chromatic Number, Book's Theorem Hajo's Conjecture, ChromaticPolynomials, 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 ProblemPlanar 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,ThePersonnel 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

Text

1 J.A Bondy and U.S Murty, Graph Theory with Applications, The MacMillan Press Ltd, 1976

2 John Clark and Derek Allan Holtan, A First Look at Graph Theory, Allied Publishers, Ltd

Reference:

1. F. Harraray, Graph Theory, Narosa Publishing House.

2. NarasinghDeo, Graph Theory with applications to Engineering andComputer 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	06-06-2019 To 07-06-2019	1	Independent Sets and Cliques.
		2	Definitions and examples
		3	Ramsey's Theorem
2	10-06-2019 To 14-06-2019	4	Ramsey number , examples.
		5	Shur's Theorem.
		6	Corollary
		7	Turan's Theorem.
		8	Class Test.
		9	Graph colouring
		10	Vertex Colorings.
3	17-06-2019 To 21-06-2019	11	Definitions ,Theorem.
		12	Chromatic Number , Proper colouring.
		13	Corollary , Lemma
		14	Book's Theorem.
		15	Hajo's Conjecture.
		16	Assignment, Seminar
		17	Class Test.
4	24-06-2019 To 28-06-2019	18	Definitions and Examples
		19	Chromatic Polynomials.
		20	Example Problems.
		21	Theorem , Corollary.
		22	Assignment
		23	Girth and Chromatic Number
		24	Theorem ,Corollary.
5	01-07-2019 To 05-07-2019	25	Theorem.
		26	Class Test.
		03 July	St.Thomas Day
		27	Edge Colourings.
		28	Edge Chromatic Number.
		29	Theorem.
		30	Assignment
		31	Vizing's Theorem
		32	Class Test.

No of Weeks	Dates	Session	Topic
6	08-07-2019 To 12-07-2019	33	The Timetabling Problem .
		34	Seminar.
		35	Planar and Plane Graph.
		36	Theorem.
		37	Assignment
		38	Dual Graphs.
7	15-07-2019 To 19-07-2019	39	Theorem.
		40	Class Test.
		42	Euler's Formula
		43	Theorem.
		44	Bridges.
		45	Theorem.
		46	Kuratowski's Theorem.
8	22-07-2019 To 26-07-2019	**22 July**	**First Internal Exam**
			First Internal Exam
			First Internal Exam
			First Internal Exam
			First Internal Exam
			First Internal Exam
9	29-07-2019 To 02-08-2019	47	Seminar.
		48	The Five Colour Theorem.
		49	Theorem.
		31 July	**KarkadakaVavu**
		50	Definitions ,Theorem.
		51	Non Hamiltonian Planar Graphs.
		52	Theorem.
		53	Diracs' theorem.
10	05-08-2019 To 09-08-2019	54	Assignment.
		55	Definitions ,Theorem.
		56	Theorem.
		57	Corollary.
		58	Lemma , Corollary.
		59	Seminar.
		60	Revision.
11	12-08-2019 To 16-08-2019	61	Class Test.
		62	Matchings .
		15 Aug	**Independence day**
		63	Matchings and Coverings in bipartite Graphs.

No of Weeks	Dates	Session	Topic
		64	Theorem.
		65	Example Problems.
12	19-08-2019 To 23-08-2019	66	Seminar.
		67	Class Test.
		68	Perfect Matchings.
		69	Theorem.
		70	The Personnel Assignment Problem
		71	Example Problems.
		23 Aug	SreekrishnaJayanthi
13	26-08-2019 To 30-08-2019	72	The Optimal Assignment Problem.
		73	Example Problems.
		28 Aug	AyyankaliJayanthi
		74	Assignment.
		75	Class Test.
		76	Networks
		77	Theorem.
14	02-09-2019 To 06-09-2019	78	Seminar.
		79	Flows and Cuts.
		80	Theorem.
		81	Theorem.
		82	Class Test.
		83	Seminar.
			Onam Celebration
15	09-09-2019 To 13-09-2019		Muharram
			First Onam
			Thiruvonam
			Third Onam
			Fourth Onam - SreeNarayana Guru Jayanthi
16	16-09-2019 To 20-09-2019	84	Separating sets.
		85	Theorem.
		86	Menger's Theorem
		87	Corollary.
		88	Seminar.
		89	Class Test.
		90	Revision through previous university questions.
17	23-09-2019 To	23 Spt	**Second Internal**
			Second Internal
			Second Internal

No of Weeks	Dates	Session	Topic
	27-09-2019		Second Internal
			Second Internal
18	30-09-2019 To 04-10-2019		Study Leave
			Study Leave
		2 Oct	Gandhi Jayanthi
			Study Leave
			Study Leave
			Study Leave
19	07-10-2019 To 11-10-2019	07 Oct	Mahanavami
		08 Oct	Vijayadashami
		09 Oct	University Exam Begin