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

(2019 – 21)

SEMESTER - I

ACADEMIC YEAR – (2019–20)

I Semester MSc MATHEMATICS (2019 - 21)			
SL. No.	**Name of Subjects with Code**	**Name of the Teacher**	**Duty Hours per week**
1.	MAT 1C 01 Basic Abstract Algebra	Prija V.	5
2.	MAT 1C 02 Linear Algebra	Remya Raj	5
3.	MAT 1C 03 Real Analysis	Riya Baby	5
4.	MAT 1C 04 Basic Topology	Ajeena Joseph	5
5.	MAT 1C 05 Differential Equations	Sebin Abraham	5
6.			
7.			
8.			
	Class In-charge	**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	3.35 Pm- 04.30 Pm
1	MAT 1C 05 Differential Equations	MAT 1C 04 Basic Topology	MAT 1C 02 Linear Algebra	MAT 1C 01 Basic Abstract Algebra	MAT 1C 02 Linear Algebra	MAT 1C 03 Real Analysis
2	MAT 1C 02 Linear Algebra	MAT 1C 04 Basic Topology	MAT 1C 01 Basic Abstract Algebra	MAT 1C 03 Real Analysis	MAT 1C 05 Differential Equations	MAT 1C 01 Basic Abstract Algebra
3	MAT 1C 02 Linear Algebra	MAT 1C 01 Basic Abstract Algebra	MAT 1C 05 Differential Equations	MAT 1C 04 Basic Topology	MAT 1C 03 Real Analysis	MAT 1C 04 Basic Topology
4	MAT 1C 04 Basic Topology	MAT 1C 03 Real Analysis	MAT 1C 04 Basic Topology	MAT 1C 01 Basic Abstract Algebra	MAT 1C 05 Differential Equations	MAT 1C 05 Differential Equations
5	MAT 1C 03 Real Analysis	MAT 1C 05 Differential Equations	MAT 1C 02 Linear Algebra	MAT 1C 03 Real Analysis	MAT 1C 01 Basic Abstract Algebra	MAT 1C 02 Linear Algebra

Subject Code:	**MAT 1C 01**
Subject Name:	**Basic Abstract Algebra**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of Faculty	**Prija V.**

Unit I

Direct Products and finitely generated Abelian Groups, Group Action on a Set, Applications of Sylow Theorems.(Chapter-2: Section 11; Chapter-3: Section 16; Chapter-7: Sections 36, 37)

Unit II

Field of Quotients of the Integral Domain, Isomorphism Theorems, Series of Groups, Free Abelian Groups, Field of Quotients of the Integral Domain(Chapter-4: Section 21, Chapter-7: Section 34, 35, 38).

Unit III

Ring of Polynomials, Factorization of Polynomials over a Field, Homomorphisms and Factor Rings, Prime and Maximal Ideals (Chapter-4: Section 22, 23; Chapter-5: Section 26, 27).

Text Book:

John. B. Fraleigh – A First Course in Abstract Algebra (7th Edition)**,** Narosa (2003)

Reference:

1. N. Herstein: Topics in Algebra.Wiley India Pvt. Ltd, 2006
2. D. S. Malik, John. N. Merdson, M. K. Sen: Fundamentals of Abstract Algebra McGraw-hill Publishing Co., 1996
3. Clark, Allen: Elements of Abstract Algebra. Dover Publications, 1984
4. David M. Burton: A First course in Rings and Ideals.Addison-Wesley Educational Publishers Inc., 1970
5. Joseph. A. Gallian: Contemporary Abstract Algebra. Narosa, 1999
6. M. Artin: Algebra Addison Wesley; 2nd edition, 2010

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	17-06-2019 To 21-06-2019	1	Direct Products .
		2	Definitions .
		3	finitely generated Abelian Groups
		4	Theorem.
		5	Class test.
		6	Group Action on a Set
2	24-06-2019 To 28-06-2019	7	Definitions .
		8	Theorem.
		9	Theorem.
		10	Class test.
		11	Definitions .
		12	Theorem.
3	01-07-2019 To 05-07-2019	13	Theorem.
		3 July	St. Thomas Day
		14	Class test.
		15	Theorem.
		16	Definitions .
		17	Applications of Sylow Theorems
		18	First sylow theorem.
4	08-07-2019 To 12-07-2019	19	Theorem.
		20	Example problems
		21	Theorem.
		22	Theorem.
		23	Third sylow theorem.
		24	Second sylow theorem.
		25	Assignment problems.
5	15-07-2019 To 19-07-2019	26	Example problems
		27	Theorem.
		28	Theorem.
		29	Class test.
		30	Third sylow theorem.
		31	Theorem.
6	22-07-2019 To	32	Theorem.
		33	Seminar.
		34	Seminar.

No of Weeks	Dates	Session	Topic
	26-07-2019	35	Seminar.
		36	Seminar.
		37	Seminar.
7	29-07-2019 To 02-08-2019	38	Exercise Questions.
		39	Exercise Questions.
		40	Exercise Questions.
		31 July	KarkadakaVavu
		41	Class test.
		42	Exercise Questions.
		43	Exercise Questions.
8	05-08-2019 To 09-08-2019	44	Seminar.
		45	Seminar.
		46	Field of Quotients of the Integral Domain .
		47	Definition .
		48	Theorem.
		49	Theorem.
9	12-08-2019 To 16-08-2019	50	Isomorphism Theorems.
		51	Theorem.
		15 Aug	Independence day
		52	Theorem.
		53	Series of Groups,
		54	Definition.
		55	Theorem.
10	19-08-2019 To 23-08-2019	56	Free Abelian Groups.
		57	Definition.
		58	Theorem.
		59	Theorem.
		60	Class test.
		61	Seminar.
		62	Seminar.
		23 Aug	SreekrishnaJayanthi
11	26-08-2019 To 30-08-2019	26 Aug	**First Internal Exam**
			First Internal Exam
		28 Aug	AyyankaliJayanthi
			First Internal Exam
			First Internal Exam
			First Internal Exam
	02-09-2019	63	Assignment.

No of Weeks	Dates	Session	Topic
12	To 06-09-2019	64	Seminar.
		65	Seminar.
		66	Seminar.
		67	Class test.
		68	Seminar.
		69	Assignment.
			Onam Celebration
13	09-09-2019 To 13-09-2019		**Muharram**
			First Onam
			Thiruvonam
			Third Onam
			Fourth Onam - SreeNarayana Guru Jayanthi
14	16-09-2019 To 20-09-2019	70	Ring of Polynomials.
		71	Definitions .
		72	Theorem.
		73	Theorem.
		74	Theorem.
		75	Theorem.
		76	Factorization of Polynomials over a Field.
		77	Definitions .
		78	Theorem.
15	23-09-2019 To 27-09-2019	79	Theorem.
		80	Seminar.
		81	Seminar.
		82	Homomorphisms and Factor Rings.
		83	Theorem.
		84	Theorem.
		85	Theorem.
		86	Prime and Maximal Ideals.
		87	Theorem.
		88	Seminar.
16	30-09-2019 To 04-10-2019	89	Revision.
		90	Revision.
		2 Oct	**Gandhi Jayanthi**
		3 Oct	**Second Internal**
			Second Internal
			Second Internal
	07-10-2019	07 Oct	**Mahanavami**

No of Weeks	Dates	Session	Topic
17	To 11-10-2019	08 Oct	Vijayadashami
			Second Internal
			Second Internal
			Second Internal
			Study Leave
			Study Leave
			Study Leave
18	14-10-2019 To 18-10-2019		Study Leave
			Study Leave
			Study Leave
			Study Leave
			Study Leave
			Study Leave
19	21-10-2019 To 25-10-2019		University Exam Begin

Subject Code:	**MAT 1C 02**
Subject Name:	**Linear Algebra**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of Faculty	**Remya Raj**

Unit I

Linear Transformations: Liner Transformations, The Algebra of Linear Transformations,Isomorphism, Representation of Transformation by Matrices, Linear Functional, The DoubleDual The Transpose of a Linear Transformation.
(Chapter-3; Sections 3.1, 3.2,3.3, 3.4, 3.5, 3.6, 3.7)

Unit II

Elementary Canonical Forms: Introductions, Characteristic Values, Annihilating Polynomials Invariant Subspace, Simultaneous Triangulations& Simultaneous Diagonalisation.
(Chapter-6: Section 6.1, 6.2,6.3, 6.4, 6.5, 6.6)

Unit III

Elementary Canonical Forms: Invariant Direct Sums, The Primary Decomposition Theorem.
The Rational and Jordan Forms: Cyclic Subspaces and Annihilators, Cyclic Decomposition
and the Rational Forms, The Jordan Forms.
Inner Product Spaces: Inner Products, Inner Product Spaces.
(Chapter-6: Sections 6.7, 6.8; Chapter-7: Sections: 7.1, 7.2, 7.3 (Omit Proof of the theorems inthis (7.3) section); Chapter-8: Sections 8.1, 8.2)

Text Book:

Kenneth Hoffman & Ray Kunze; Linear Algebra; Second Edition, Prentice-Hall ofIndia Pvt. Ltd

Reference:

1. Stephen H. Friedberg, Arnold J Insel and Lawrence E. Spence: Linear Algebra: 4th Edition 2002: Prentice Hall.
2. Serge A Land: Linear Algebra; Springer
3. Paul R Halmos Finite-Dimensional Vector Space; Springer 1974.
4. McLane &GarrellBirkhoff; Algebra; American Mathematical Society 1999.
5. Thomas W. Hungerford: Algebra; Springer 1980
6. Neal H.McCoy& Thomas R.Berger: Algebra-Groups, Rings & Other Topics: Allyn& Bacon.
7. S Kumaresan; Linear Algebra A Geometric Approach; Prentice-Hall of India 2003.

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	17-06-2019 To 21-06-2019	1	Linear transformation, introduction, examples
		2	Theorem 1,Problems
		3	Null Space, Range Space, examples
		4	Rank Nullity theorem, problems
		5	Theorem 4,Theorem 6
		6	Linear operators, problems
2	24-06-2019 To 28-06-2019	7	Theorem 5,problems
		8	Invertible linear transformations
		9	Theorem 7,problems
		10	Non singular linear transformations, examples
		11	Theorem 8,problems
		12	Theorem 9,problems
3	01-07-2019 To 05-07-2019	13	Isomorphism, examples
		3 July	St. Thomas Day
		14	Theorem 10,problems
		15	**Class test**
		16	Representation of transformations by matrices, examples
		17	Theorem 11,problems
		18	Matrix of T, Definition, Theorem 12
4	08-07-2019 To 12-07-2019	19	Problems
		20	Theorem 13
		21	Theorem 14
		22	Problems
		23	Linear functionals, definition, Dual space
		24	Theorem 15
		25	Annihilater of a set, Definition. Theorem 16
5	15-07-2019 To 19-07-2019	26	Corollary with proof
		27	problems
		28	Double dual, definition, Theorem 17
		29	Corollary 1,2..Theorem18
		30	Hyper space, Theorem 19
		31	Theorem 20
6	22-07-2019 To 26-07-2019	32	The transpose of a L. T, Theorem 21
		33	Theorem 22,problems
		34	**Class test**
		35	Inner product space, definition, examples

No of Weeks	Dates	Session	Topic
		36	Norm, Normed space, Polarization identities
		37	Theorem 1,problems
7	29-07-2019 To 02-08-2019	38	Orthogonal vectors, Theorem 2,3.
		39	Gram Schmidt orthogonolization process
		40	Problems
		31 July	KarkadakaVavu
		41	Best approximation, definition, Theorem 4.
		42	Orthogonal complement, orthogonal projection
		43	Corollary, problems
8	05-08-2019 To 09-08-2019	44	Theorem 5,corollary
		45	Bessel's inequality
		46	**Class test**
		47	Unit 2- Elementary canonical form, characteristic values, problems
		48	Theorem 1,problems
		49	Characteristic polynomial, definition, Lemma
9	12-08-2019 To 16-08-2019	50	problems
		51	Lemma, Theorem 2
		15 Aug	Independence day
		52	Problems
		53	Annihilating polynomial, ideals, Theorem 3
		54	Problems
		55	Cayley- Hamilton theorem
10	19-08-2019 To 23-08-2019	56	Problems
		57	Invariant Subspace, examples
		58	Lemma, T- conducter
		59	Triangulable transformations, lemma
		60	Theorem 5
		61	Revision
		62	**Class test**
		23 Aug	SreekrishnaJayanthi
11	26-08-2019 To 30-08-2019	26 Aug	**First Internal Exam**
			First Internal Exam
		28 Aug	AyyankaliJayanthi
			First Internal Exam
			First Internal Exam
			First Internal Exam
	02-09-2019	63	Theorem 5

No of Weeks	Dates	Session	Topic
12	To 06-09-2019	64	Theorem 6
		65	Simultaneous triangulation and diagonalization, lemma
		66	Theorem 7,8
		67	Direct sum decomposition, Theorem 9
		68	Invariant direct sum, problems
		69	Revision
			Onam Celebration
13	09-09-2019 To 13-09-2019		**Muharram**
			First Onam
			Thiruvonam
			Third Onam
			Fourth Onam - SreeNarayana Guru Jayanthi
14	16-09-2019 To 20-09-2019	70	Theorem 10,problems
		71	Theorem 11,problems
		72	Primary decomposition theorem
		73	problems
		74	problems
		75	**Class test**
		76	Jordan form of a matrix, problems
		77	Problems
		78	Problems
15	23-09-2019 To 27-09-2019	79	seminar
		80	seminar
		81	seminar
		82	Cyclic subspaces, examples, problems
		83	Problems
		84	Problems
		85	Revision of unit 3
		86	Revision of unit 3
		87	**Class test**
		88	Revision of unit 1
16	30-09-2019 To 04-10-2019	89	Revision of unit 1 continues, revision of unit 2
		90	Revision of unit 2
		2 Oct	**Gandhi Jayanthi**
		3 Oct	**Second Internal**
			Second Internal
			Second Internal
	07-10-2019	07 Oct	**Mahanavami**

No of Weeks	Dates	Session	Topic
17	To 11-10-2019	08 Oct	Vijayadashami
			Second Internal
			Second Internal
			Second Internal
			Study Leave
			Study Leave
			Study Leave
18	14-10-2019 To 18-10-2019		Study Leave
			Study Leave
			Study Leave
			Study Leave
			Study Leave
			Study Leave
19	21-10-2019 To 25-10-2019		University Exam Begin

Subject Code:	MAT 1C 03
Subject Name:	Real Analysis
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of Faculty	**Riya Baby**

Unit-I

Basic Topology: Finite, Countable and Uncountable Sets, Metric Spaces, Compact Sets PerfectSets, Connected Sets, Continuity: Limits of Functions, Continuous Functions, Continuity and Compactness, Continuity and Connectedness, Discontinuities, Monotonic Functions, Infinitelimits and Limits at Infinity.
(Text Book1; Chapter-2, All sections: Chapter-4, All sections)

Unit-II

Differentiation: The derivative of Real Function, Mean Value Theorems, The Continuity ofDerivatives, L 'Hospital's Rule, Derivatives of Higher Order Taylor's Theorem,Differentiation of Vector-Valued Functions. The Riemann-Stieltjes Integral: Definition and Existence of the Integral, Properties of the Integral.
(Text Book 1: Chapter-5; All sections; Chapter-6; sections 6.1 to 6.19)

Unit-III

The Riemann-Stieltjes Integral (Continued); Integration and Differentiation, Integration ofVector-Valued Functions,(Text Book 1: Chapter-6; Sections 6.20 to 6.25;)Functions of Bounded Variations and Rectifiable Curves.(Text Book2; Chapter-6; Sections 6.1 to 6.12)

Text Book

I: Walter Rudin: Principles of Mathematical Analysis; 3rd Edition McGraw-Hill International
2: T.M Apostol: Mathematical Analysis 2nd Edition; Narosa Publications (1973)

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 real variable; Tata McGraw-HillBook Co.
3. M.H Porter and C.B Moraray; A first Course in Real Analysis; SpringerVerlag UTM 1977.
4. S.C Sexena and S.M Shah: Introduction to Real Variable Theory, IntextEducational Publishers, San Francisco
5. S.R Ghopade and B.V Limaye; A Course in Calculus and Real Analysis,Springer.
6. N.L Carothers- Real Analysis Cambridge University Press.

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	17-06-2019 To 21-06-2019	1	Basic Topology
		2	Basic Topology
		3	Finite, Countable and Uncountable Sets
		4	Finite, Countable and Uncountable Sets
		5	Finite, Countable and Uncountable Sets
		6	Metric Spaces
2	24-06-2019 To 28-06-2019	7	Metric Spaces
		8	Compact Sets
		9	Compact Sets
		10	Compact Sets
		11	Compact Sets
		12	Compact Sets
3	01-07-2019 To 05-07-2019	13	Perfect Sets
		14	Perfect Sets
		3 July	St. Thomas Day
		15	Perfect Sets
		16	Connected Sets
		17	Connected Sets
		18	Connected Sets
4	08-07-2019 To 12-07-2019	19	Continuity: Limits of Functions
		20	Continuity: Limits of Functions
		21	Continuous Functions
		22	Continuous Functions
		23	Continuous Functions
		24	Continuity and Compactness
		25	Continuity and Compactness
5	15-07-2019 To 19-07-2019	26	Continuity and Compactness
		27	Continuity and Connectedness
		28	Continuity and Connectedness
		29	Continuity and Connectedness
		30	Discontinuities, Monotonic Functions
		31	Discontinuities, Monotonic Functions
	22-07-2019	32	Infinite limits and Limits at Infinity
		33	Infinite limits and Limits at Infinity

No of Weeks	Dates	Session	Topic
6	To 26-07-2019	34	Test Paper
		35	Seminar
		36	Differentiation: The derivative of Real Function
7	29-07-2019 To 02-08-2019	37	Differentiation: The derivative of Real Function
		38	Mean Value Theorems
		31 July	KarkadakaVavu
		39	Mean Value Theorems
		40	Mean Value Theorems
		41	The Continuity of Derivatives
8	05-08-2019 To 09-08-2019	42	The Continuity of Derivatives
		43	The Continuity of Derivatives
		44	L 'Hospital's Rule
		45	L 'Hospital's Rule
		46	Derivatives of Higher Order Taylor's Theorem
		47	Derivatives of Higher Order Taylor's Theorem
		48	Differentiation of Vector-Valued Functions
		49	Differentiation of Vector-Valued Functions
9	12-08-2019 To 16-08-2019	50	Differentiation of Vector-Valued Functions
		51	Test Paper
		15 Aug	Independence day
		52	The Riemann-Stieltjes Integral
		53	The Riemann-Stieltjes Integral
		54	Definition and Existence of the Integral
		55	Definition and Existence of the Integral
10	19-08-2019 To 23-08-2019	56	Definition and Existence of the Integral
		57	Definition and Existence of the Integral
		58	Definition and Existence of the Integral
		59	Properties of the Integral
		60	Assignment
		61	Properties of the Integral
		62	Properties of the Integral
		23 Aug	SreekrishnaJayanthi
11	26-08-2019 To 30-08-2019	26 Aug	First Internal Exam
			First Internal Exam
		28 Aug	AyyankaliJayanthi
			First Internal Exam
			First Internal Exam
			First Internal Exam

No of Weeks	Dates	Session	Topic
12	02-09-2019 To 06-09-2019	63	Seminar
		64	Seminar
		65	Properties of the Integral
		66	Properties of the Integral
		67	Properties of the Integral
		68	Assignment
		69	Discussion
			Onam Celebration
13	09-09-2019 To 13-09-2019		**Muharram**
			First Onam
			Thiruvonam
			Third Onam
			Fourth Onam - SreeNarayana Guru Jayanthi
14	16-09-2019 To 20-09-2019	70	The Riemann-Stieltjes Integral (Continued)
		71	The Riemann-Stieltjes Integral (Continued)
		72	Integration and Differentiation
		73	Integration and Differentiation
		74	Integration and Differentiation
		75	Integration and Differentiation
		76	Test paper
		77	Integration of Vector-Valued Functions
		78	Integration of Vector-Valued Functions
15	23-09-2019 To 27-09-2019	79	Integration of Vector-Valued Functions
		80	Integration of Vector-Valued Functions
		81	Assignment
		82	Seminar
		83	Functions of Bounded Variations and Rectifiable Curves
		84	Functions of Bounded Variations and Rectifiable Curves
		85	Functions of Bounded Variations and Rectifiable Curves
		86	Functions of Bounded Variations and Rectifiable Curves
		87	Functions of Bounded Variations and Rectifiable Curves
		88	Test Paper
16	30-09-2019 To 04-10-2019	89	Question paper discussion
		90	Question paper discussion
		2 Oct	**Gandhi Jayanthi**
		3 Oct	**Second Internal**
			Second Internal
			Second Internal

No of Weeks	Dates	Session	Topic
17	07-10-2019 To 11-10-2019	07 Oct	Mahanavami
		08 Oct	Vijayadashami
			Second Internal
			Second Internal
			Second Internal
			Study Leave
			Study Leave
			Study Leave
18	14-10-2019 To 18-10-2019		Study Leave
			Study Leave
			Study Leave
			Study Leave
			Study Leave
			Study Leave
19	21-10-2019 To 25-10-2019		University Exam Begin

Subject Code:	**MAT 1C 04**
Subject Name:	**Basic Topology**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of Faculty	**Ajeena Joseph**

Unit – I

Topological Spaces: The Definition and Examples, Basis for a Topology, Closed Sets, Closuresand Interiors of Sets, Metric spaces, Convergence, Continuous functions andHomeomorphisms.

[Chapter 1: Sections 1.2 to 1.7, excluding Theorem 1.46 and Theorem 1.51]

Unit – II

New spaces from old ones: Subspaces, The Product Topology on X x Y, The Product Topology,The Weak Topology and the Product Topology.

[Chapter 2: Sections 2.1 to 2.4]

Unit – III

Connectedness in metric spaces: Connected spaces, Pathwise and Local connectedness, Totallydisconnected space,

[Chapter 3: Sections 3.1 to 3.3 excluding Theorem 3. 29 and Theorem 3.30]

Text:

C. Wayne Patty, Foundations of Topology, Second Edition – Jones & Bartlett India Pvt. Ltd.,New Delhi, 2012.

References:

1. K. D. Joshi, Introduction to General Topology, New Age International (P) Ltd., Publishers.
2. Dugundji, Topology, Prentice Hall of India.
3. G. F. Simmons, Introduction to Topology and Modern Analysis, McGraw Hill.
4. S. Willard, General Topology , Addison Wesley Publishing Company.5.
5. J.R.Munkers,Topology: A First Course, Prentice Hall of India.
6. Murdeshwar M. G., General Topology, second edition, Wiley Eastern.
7. Kelley, General Topology, van Nostrand, Eastern Economy Edition.

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	17-06-2019 To 21-06-2019	1	Definition
		2	Examples
		3	Indiscrete topology
		4	Discrete topology
		5	Co- countable topology
		6	Co-finite topology
2	24-06-2019 To 28-06-2019	7	Metrizable spaces
		8	Examples
		9	Theorems
		10	Theorems
		11	Class Test
3	01-07-2019 To 05-07-2019	12	Basis
		13	Basis
		3 July	St. Thomas Day
		14	Sub basis
		15	Sub basis
		16	Theorems
4	08-07-2019 To 12-07-2019	17	Theorems
		18	Examples
		19	Closed set
		20	Closed set
		21	Theorems
		22	Theorems
5	15-07-2019 To 19-07-2019	23	Closure
		24	Theorems
		25	Theorems
		26	Interior
		27	Theorems
		28	Class Test
		29	Assignment
6	22-07-2019 To 26-07-2019	30	Examples
		31	Metric spaces
		32	Metric spaces
		33	Convergence

No of Weeks	Dates	Session	Topic
		34	Convergence
		35	Continuous functions
7	29-07-2019 To 02-08-2019	36	Question paper discussion
		37	Subspaces
		38	Subspaces
		31 July	KarkadakaVavu
		39	Subspaces
		40	Examples
		41	Examples
8	05-08-2019 To 09-08-2019	42	Class Test
		43	The Product Topology on X x Y
		44	The Product Topology on X x Y
		45	The Product Topology on X x Y
		46	Problems
		47	Problems
		48	Theorems
		49	Weak topology
9	12-08-2019 To 16-08-2019	50	Weak topology
		51	Weak topology
		15 Aug	Independence day
		52	Weak topology
		53	Seminar
		54	Class Test
		55	The product topology
10	19-08-2019 To 23-08-2019	56	The product topology
		57	The product topology
		58	Theorems
		59	Theorems
		60	Class Test
		61	Question paper discussion
		62	Revision
		23 Aug	SreekrishnaJayanthi
11	26-08-2019 To 30-08-2019	26 Aug	First Internal Exam
			First Internal Exam
		28 Aug	AyyankaliJayanthi
			First Internal Exam
			First Internal Exam
			First Internal Exam

No of Weeks	Dates	Session	Topic
12	02-09-2019 To 06-09-2019	63	Connectedness in metric spaces
		64	Connected spaces
		65	Connected spaces
		66	Connected spaces
		67	Examples
		68	Examples
		69	Theorems
			Onam Celebration
13	09-09-2019 To 13-09-2019		**Muharram**
			First Onam
			Thiruvonam
			Third Onam
			Fourth Onam - SreeNarayana Guru Jayanthi
14	16-09-2019 To 20-09-2019	70	Pathwise connected spaces
		71	Pathwise connected spaces
		72	Pathwise connected spaces
		73	Theorems
		74	Class Test
		75	Theorems
		76	Theorems
		77	Local connectedness
		78	Local connectedness
15	23-09-2019 To 27-09-2019	79	Local connectedness
		80	Local connectedness
		81	Class Test
		82	Assignment
		83	Seminar-totally disconnected spaces
		84	Seminar-totally disconnected spaces
		85	Seminar -totally disconnected spaces
		86	Seminar-totally disconnected spaces
		87	Class Test
		88	Revision
16	30-09-2019 To 04-10-2019	89	Revision
		90	Revision
		2 Oct	**Gandhi Jayanthi**
		3 Oct	**Second Internal**
			Second Internal
			Second Internal

No of Weeks	Dates	Session	Topic
17	07-10-2019 To 11-10-2019	07 Oct	Mahanavami
		08 Oct	Vijayadashami
			Second Internal
			Second Internal
			Second Internal
			Study Leave
			Study Leave
			Study Leave
18	14-10-2019 To 18-10-2019		Study Leave
			Study Leave
			Study Leave
			Study Leave
			Study Leave
			Study Leave
19	21-10-2019 To 25-10-2019		University Exam Begin

Subject Code:	**MAT 1C 05**
Subject Name:	**Differential Equations**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of Faculty	**Sebin Abraham**

Unit I

Introduction: A Review of Power Series, Series Solutions of First Order Equations, SecondOrder Linear Equations. Ordinary Points , Regular Singular Points, Regular Singular Points(Continued), Gauss's Hyper Geometric Equation, The Point at Infinity. (Chapter-5; Sections 26 to 32)

Unit II

Legendre Polynomials, Properties of Legendre Polynomials, Bessel Functions. The GammaFunction, Properties of Bessel functions, General Remarks on Systems, Linear SystemsHomogeneous Linear Systems with Constant Coefficients.
(Chapter-8; Sections 44 to 47; Chapter-10; Sections 54 to 56)

Unit III

Oscillations and the Sturm Separation Theorem, The Sturm Comparison Theorem, The Methodof Successive Approximations, Picard's Theorem, Systems. The Second Order Linear Equation
(Chapter-4; Sections 24 and 25; Chapter-13; Sections 68 to 70)

Text Book:

G.F Simmons - Differential Equations with Historical Notes; Third Edition-CRC Press,Taylor and Francis Group.

Reference:

1. G.Birkoff and G.C Rota: Ordinary Differential Equations; Wiley and Sons; (1978)
2. E.A Coddington; An Introduction to Ordinary Differential Equations; Prentice Hall of India,New Delhi (1974)
3. P.Hartmon; Ordinary Differential Equations; John Wiley and Sons
4. Chakraborti; Elements of Ordinary Differential Equations and Special Functions; WileyEastern Ltd New Delhi (1990)
5. L.S Poutrigardian: A Course in Ordinary Differential Equations; Hindustan PublishingCorporation Delhi (1967)
6. S.G Deo&V.Raghavendra; Ordinary Differential Equations and Stability Theory; TataMcGraw Hill New Delhi (1967)
7.V.I Arnold; Ordinary Differential Equations; MIT Press, Cambridge 1981

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	17-06-2019 To 21-06-2019	1	A Review of Power Series
		2	A Review of Power Series
		3	Series Solutions of First Order Equations,
		4	Series Solutions of First Order Equations
		5	Second Order Linear Equations
		6	Second Order Linear Equations
2	24-06-2019 To 28-06-2019	7	Second Order Linear Equations
		8	Ordinary Points
		9	Ordinary Points
		10	Regular Singular Points
		11	Regular Singular Points
		12	Regular Singular Points
3	01-07-2019 To 05-07-2019	13	Regular Singular Points
		14	Regular Singular Points(Continued)
		3 July	St. Thomas Day
		15	Regular Singular Points(Continued)
		16	Regular Singular Points(Continued)
		17	Regular Singular Points(Continued)
		18	Regular Singular Points(Continued)
4	08-07-2019 To 12-07-2019	19	Class test
		20	Regular Singular Points(Continued)
		21	Gauss's Hyper Geometric Equation
		22	Gauss's Hyper Geometric Equation
		23	Gauss's Hyper Geometric Equation
		24	Gauss's Hyper Geometric Equation
		25	Gauss's Hyper Geometric Equation
5	15-07-2019 To 19-07-2019	26	Class test
		27	The Point at Infinity
		28	The Point at Infinity
		29	The Point at Infinity
		30	Review of power series solutions
		31	Review of power series solutions
	22-07-2019	32	Legendre Polynomials
		33	Legendre Polynomials

No of Weeks	Dates	Session	Topic
6	To 26-07-2019	34	Properties of Legendre Polynomials
		35	Properties of Legendre Polynomials
		36	Properties of Bessel functions,
		37	Bessel Functions
7	29-07-2019 To 02-08-2019	38	Bessel Functions
		39	Bessel Functions
		40	Bessel Functions
		31 July	KarkadakaVavu
		41	Bessel Functions
		42	Bessel Functions
		43	The Gamma Function
8	05-08-2019 To 09-08-2019	44	The Gamma Function
		45	The Gamma Function
		46	The Gamma Function
		47	The Gamma Function
		48	The Gamma Function
		49	Class test
9	12-08-2019 To 16-08-2019	50	General Remarks on Systems
		51	General Remarks on Systems
		15 Aug	Independence day
		52	General Remarks on Systems
		53	Class test
		54	Seminar
		55	Seminar
10	19-08-2019 To 23-08-2019	56	Seminar
		57	Linear Systems Homogeneous Linear Systems with Constant Coefficients
		58	Linear Systems Homogeneous Linear Systems with Constant Coefficients
		59	Linear Systems Homogeneous Linear Systems with Constant Coefficients
		60	Linear Systems Homogeneous Linear Systems with Constant Coefficients
		61	Review of the unit
		62	Review of the unit
		23 Aug	SreekrishnaJayanthi
11	26-08-2019 To	26 Aug	**First Internal Exam**
			First Internal Exam
		28 Aug	AyyankaliJayanthi

No of Weeks	Dates	Session	Topic
	30-08-2019		**First Internal Exam**
			First Internal Exam
			First Internal Exam
12	02-09-2019 To 06-09-2019	63	Oscillations and the Sturm Separation Theorem
		64	Oscillations and the Sturm Separation Theorem
		65	Oscillations and the Sturm Separation Theorem
		66	The Sturm Comparison Theorem
		67	The Sturm Comparison Theorem
		68	The Method of Successive Approximations
		69	The Method of Successive Approximations
			Onam Celebration
13	09-09-2019 To 13-09-2019		**Muharram**
			First Onam
			Thiruvonam
			Third Onam
			Fourth Onam - SreeNarayana Guru Jayanthi
14	16-09-2019 To 20-09-2019	70	The Method of Successive Approximations
		71	The Method of Successive Approximations
		72	Picard's Theorem
		73	Picard's Theorem
		74	Picard's Theorem
		75	Picard's Theorem
		76	Picard's Theorem
		77	Class test
		78	Seminar
15	23-09-2019 To 27-09-2019	79	Seminar
		80	The Second Order Linear Equation
		81	The Second Order Linear Equation
		82	The Second Order Linear Equation
		83	The Second Order Linear Equation
		84	The Second Order Linear Equation
		85	Review of unit 3
		86	Class test of unit 3
		87	Review of unit 2,1
		88	Class test of unit 2,1
16	30-09-2019 To	89	Discussing very important topics
		90	Discussing very important topics
		2 Oct	**Gandhi Jayanthi**

No of Weeks	Dates	Session	Topic
	04-10-2019	3 Oct	Second Internal
			Second Internal
			Second Internal
17	07-10-2019 To 11-10-2019	07 Oct	Mahanavami
		08 Oct	Vijayadashami
			Second Internal
			Second Internal
			Second Internal
			Study Leave
			Study Leave
			Study Leave
18	14-10-2019 To 18-10-2019		Study Leave
			Study Leave
			Study Leave
			Study Leave
			Study Leave
			Study Leave
	21-10-2019 To 25-10-2019		University Exam Begin