DON BOSCO ARTS & SCIENCE COLLEGE

ANGADIKADAVU

(Affiliated to Kannur University Approved by Government of Kerala)

ANGADIKADAVU P.O., IRITTY, KANNUR – 670706

COURSE PLAN

Mathematics

(2018 – 21)

SEMESTER -V

ACADEMIC YEAR- (2020-21)

V Semester B.Sc. Mathematics (2018 - 21)			
SL. No.	Name of Subjects with Code	Name of the Teacher	Duty Hours per week
1.	5B05 MAT Real Analysis	Athulya P	5
2.	5B06 MAT Abstract Algebra	Riya Baby	5
3.	5B07 MAT Differential Equations , Laplace Transform & Fourier Series	PrijaV	5
4.	5B08 MAT Vector Calculus	Ajeena Joseph	4
5.	5B09 MAT Graph Theory	Noble Philip	4
	Name of Class Incharge	Athulya P	

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	Abstract Algebra	Real Analysis	Vector Calculus	Differential Equations	Graph Theory
2	Graph Theory	Open Course	Real Analysis	Abstract Algebra	Differential Equations
3	Differential Equations	Open Course	Abstract Algebra	Real Analysis	Vector Calculus
4	Vector Calculus	Differential Equations	Graph Theory	Abstract Algebra	Real Analysis
5	Real Analysis	Vector Calculus	Differential Equations	Graph Theory	Abstract Algebra

Subject Code:	**5B05 MAT**
Subject Name:	**Real Analysis**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of the Teacher:	**Athulya P**

5B05 MAT: Real Analysis

Module - I (25 Hours)

The algebraic property of real numbers, The absolute value and Real line, The completeness property of R, Applications of the supremum property, Intervals.
(Sections 2.1 to 2.5)

Module - II (20 Hours)
Sequence and their limits, Limit theorems, Monotone sequences, Subsequence and Bolzano-Weirstrass theorem, Cauchy criterion.
(Sections 3.1 to 3.5)

Module - III (25 Hours)
Introduction to series, Absolute convergence, Tests for absolute convergence, Tests for non absolute convergence.
(Sections 3.7, 9.1, 9.2, 9.3)

Module - IV (20 Hours)
Continuous functions, Combination of continuous functions, Continuous functions on intervals - Uniform continuity, monotone and inverse functions.
(Sections 5.1 to 5.4, 5.6)
Text: R. G. Bartle and D. R. Sherbert, Introduction to Real Analysis, 3rd Edition, Wiley.

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	01-06-2020 To 05-06-2020	1	**Unit 1 The Real Numbers- Introduction**
		2	**Algebraic properties of real numbers**
		3	**Rational and irrational numbers**
		4	**Theorem**
		5	**Thorem**
2	08-06-2020 To 12-06-2020	6	**Theorem**
		7	**Inequalities**
		8	**Bernoulli's inequality**
		9	**Absolute value and the real line**
		10	**Triangle inequality**
3	15-06-2020 To 19-06-2020	11	**Examples**
		12	**Completeness property of real numbers**
		13	**Application of supremum property**
		14	**Archimedian property & Corollary**
		15	**Exam**
4	22-06-2020 To 26-06-2020	16	**The density theorem**
		17	**Intervals**
		18	**Nested interval property**
		19	**Theorem**
		20	**Periodic decimals**
5	29-06-2020 To 03-07-2020	21	**Unit 2 Sequences - Definition**
		22	**The limit of a sequence**
		23	**Uniqueness of limits**
		24	**Examples**
		03 July	St. Thomas Day
6	06-07-2020 To 10-07-2020	25	**Tails of sequences**
		26	**Theorem**
		27	**Examples**
		28	**Limit theorem**
		29	**Exam**
7	13-07-2020 To	30	**Theorem**
		31	**Examples**
		32	**Thorem**

No of Weeks	Dates	Session	Topic
	17-07-2020	33	**Thorem**
		34	**Monotone sequences**
8	20-07-2020 To 24-07-2020	20 July	KarkkidakaVavu
		35	**Examples**
		36	**Subsequences**
		37	**Monotone Subsequence theorem**
		38	**Bolzano weierstrass theorem**
9	27-07-2020 To 31-07-2020	39	**The Cauchy criterion**
		40	**Cauchy convergence criterion**
		41	**Contractive sequences**
		42	**Theorem**
		31 July	Bakrid
10	03-08-2020 To 07-08-2020	43	**Exam**
		44	**Unit 3 Series - introduction**
		45	**Examples**
		46	**Cauchy criterion for series**
		47	**Integral test**
11	10-08-2020 To 14-08-2020	48	**Comparison test**
		49	**Limit comparison test**
		50	**Examples**
		51	**Absolute convergence**
		52	**Grouping of series**
12	17-08-2020 To 21-08-2020	53	**Rearrangement of series**
		54	**Test for absolute convergence**
		55	**Test for absolute convergence**
		56	**Examples**
		57	**Examples**
13	24-08-2020 To 28-08-2020	58	**Abels lemma**
		59	**Dirichletstest, Abels test**
		60	**Unit 4 – Continuos functions**
		61	**Definition**
		28 August	AyyankaliJayanthi
14	31-08-2020 To 04-09-2020		Onam Holiday
			Onam Holiday
			Onam Holiday
			Onam Holiday
			Onam Holiday
15	07-09-2020	62	**Exam**

No of Weeks	Dates	Session	Topic
	To 11-09-2020	63	**Boundedness theoren**
		64	**The maximum minimum theorem**
		10 September	SreekrishnaJayanthi
		65	**Bolzano intermediate value thorem**
16	14-09-2020 To 18-09-2020	66	**Preservation of intervals theorem**
		67	**Discontinuity Criterion**
		68	**Examples**
		69	**Uniform Continuity**
		70	**Uniform Continuity thorem**
17	21-09-2020 To 25-09-2020	21 September	Sreenarayana Guru Samadhi
		71	**Lipschitz functions**
		72	**Examples**
		73	**Examples**
		74	**Thorem**
18	28-09-2020 To 02-10-2020	75	**Thorem**
		29 September	**IV Semester UG University Exam**
			IV Semester UG University Exam
			IV Semester UG University Exam
			IV Semester UG University Exam
19	05-10-2020 To 09-10-2020		**IV Semester UG University Exam**
			IV Semester UG University Exam
			IV Semester UG University Exam
			IV Semester UG University Exam
			IV Semester UG University Exam
20	12-10-2020 To 16-10-2020	76	
		77	Thorem
		78	Thorem
		79	Thorem
		80	**Continuos extension theoren**
21	19-10-2020 To 23-10-2020	81	**Continuos extension theoren**
		82	**Step function**
		83	**Theorem**
		84	**Corollary**
		85	**Definition**
22	26-10-2020 To 30-10-2020	26October	Vijayadasami
		86	**Exam**
		87	**Revision**
		29October	Miladi-I-Sherif
		88	**Revision**

No of Weeks	Dates	Session	Topic
23	02-11-2020 To 06-11-2020	89	**Previous years question paper discussions**
		90	**Previous years question paper discussions**
			V Semester UG Internal Exams
			V Semester UG Internal Exams
			V Semester UG Internal Exams
24	09-11-2020 To 13-11-2020		**V Semester UG Internal Exams**
			V Semester UG Internal Exams
			Study Leave
			Study Leave
			Study Leave

Subject Code:	5B06 MAT
Subject Name:	Abstract Algebra
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of the Teacher:	**RIYA BABY**

5B06 MAT: ABSTRACT ALGEBRA

Module - I (20 Hours)

Binary operations. Groups - Definition and examples, Elementary properties of groups, Finite groups and group tables. Subgroups –Subsets and Subgroups, Cyclic subgroups. Cyclic groups - Elementary properties of cyclic groups, Structure of cyclic groups, Subgroups of finite cyclic groups. (Sections 2, 4, 5, 6)

Module - II (25 Hours)

Groups of permutations – Cayley's theorem. Orbits, cycles and alternating groups (Theorem 9.15 without proof). Cosets and theorem of Lagrange. (Sections 8, 9, 10)

Module - III (20 Hours)

Homomorphisms - Structure relating maps, properties of homomorphism. Factor GroupsFactor groups from homomorphism, Fundamental homomorphism theorem. (Sections 13,14)

Module –IV (25 Hours)

Rings and fields- Homomorphism and isomorphism. Integral domains - Divisors of zero and cancellation, Characteristic of a ring. Fermat's and Euler's theorems. (Sections 18, 19, 20)

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	01-06-2020 To 05-06-2020	1	Binary operations.
		2	Binary operations-Theorem
		3	Binary operations.-Problem
		4	Binary operations.-Problem
		5	Groups - Definition
2	08-06-2020 To 12-06-2020	6	Groups - Definition and examples,
		7	Groups - Definition and examples,
		8	Elementary properties of groups
		9	Elementary properties of groups
		10	Elementary properties of groups
3	15-06-2020 To 19-06-2020	11	Finite groups
		12	Finite groups-Theorem
		13	Finite groups-theorem
		14	Finite groups-Example
		15	Finite groups-Problem
4	22-06-2020 To 26-06-2020	16	Finite groups and group tables
		17	Subgroups –Subsets and Subgroups
		18	Subgroups –Subsets and Subgroups
		19	Subgroups –Subsets and Subgroups
		20	Subgroups –Subsets and Subgroups
5	29-06-2020 To 03-07-2020	21	Cyclic subgroups
		22	Cyclic subgroups
		23	Cyclic subgroups
		24	Cyclic subgroups
		03 July	St. Thomas Day
6	06-07-2020 To 10-07-2020	25	**TEST PAPER**
		26	Cyclic groups - Elementary properties of cyclic groups
		27	Cyclic groups - Elementary properties of cyclic groups
		28	Theorem
		29	Theorem

No of Weeks	Dates	Session	Topic
7	13-07-2020 To 17-07-2020	30	Cyclic groups - Elementary properties of cyclic groups
		31	Cyclic groups - Elementary properties of cyclic groups
		32	Cyclic groups - Elementary properties of cyclic groups
		33	Cyclic groups - Elementary properties of cyclic groups
		34	Cyclic groups - Elementary properties of cyclic groups
8	20-07-2020 To 24-07-2020	20 July	KarkkidakaVavu
		35	Structure of cyclic groups
		36	Structure of cyclic groups
		37	Structure of cyclic groups
		38	Subgroups of finite cyclic groups.
9	27-07-2020 To 31-07-2020	39	Subgroups of finite cyclic groups.
		40	Subgroups of finite cyclic groups.
		41	ASSIGNMENT
		42	PROBLEM DISCUSION
		31 July	Bakrid
10	03-08-2020 To 07-08-2020	43	Groups of permutations
		44	Groups of permutations
		45	Groups of permutations
		46	Groups of permutations
		47	Cayley's theorem.
11	10-08-2020 To 14-08-2020	48	Orbits, cycles
		49	Orbits, cycles
		50	Alternating groups
		51	Alternating groups
		52	Alternating groups
12	17-08-2020 To 21-08-2020	53	Cosets
		54	Cosets
		55	Cosets
		56	Theorem of Lagrange.

No of Weeks	Dates	Session	Topic
		57	**PROBLEM SOLVING SECTION**
13	24-08-2020 To 28-08-2020	58	**PROBLEM SOLVING SECTION**
		59	**PROBLEM SOLVING SECTION**
		60	**PROBLEM SOLVING SECTION**
		61	**PROBLEM SOLVING SECTION**
		28 August	AyyankaliJayanthi
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	**TEST PAPER**
		63	Homomorphisms
		64	Homomorphisms
		10 September	SreekrishnaJayanthi
		65	Structure relating maps,
16	14-09-2020 To 18-09-2020	66	Structure relating maps,
		67	Properties of homomorphism
		68	Properties of homomorphism
		69	Properties of homomorphism
		70	Properties of homomorphism
17	21-09-2020 To 25-09-2020	21 September	Sreenarayana Guru Samadhi
		71	Factor Groups
		72	Factor Groups
		73	Factor groups from homomorphism,
		74	Factor groups from homomorphism,
18	28-09-2020 To 02-10-2020	75	Factor groups from homomorphism,
		29 September	**IV Semester UG University Exam**
			IV Semester UG University Exam
			IV Semester UG University Exam
			IV Semester UG University Exam
19	05-10-2020 To 09-10-2020		**IV Semester UG University Exam**
			IV Semester UG University Exam
			IV Semester UG University Exam
			IV Semester UG University Exam
			IV Semester UG University Exam

No of Weeks	Dates	Session	Topic
20	12-10-2020 To 16-10-2020	76	Fundamental homomorphism theorem.
		77	Fundamental homomorphism theorem.
		78	Fundamental homomorphism theorem.
		79	**SEMINAR**
		80	**PROBLEM SOLVING SECTION**
21	19-10-2020 To 23-10-2020	81	Rings and fields. (Sections 18, 19, 20).
		82	Homomorphism and isomorphism
		83	Homomorphism and isomorphism
		84	Integral domains - Divisors of zero and cancellation,
		85	Integral domains - Divisors of zero and cancellation,
22	26-10-2020 To 30-10-2020	26 October	Vijayadasami
		86	Characteristic of a ring.
		87	Fermat's and Euler's theorems.
		29October	Miladi-I-Sherif
		88	Fermat's and Euler's theorems.
23	02-11-2020 To 06-11-2020	89	Fermat's and Euler's theorems.
		90	**QUESTION PAPER SOLVING**
			V Semester UG Internal Exams
			V Semester UG Internal Exams
			V Semester UG Internal Exams
24	09-11-2020 To 13-11-2020		**V Semester UG Internal Exams**
			V Semester UG Internal Exams
			Study Leave
			Study Leave
			Study Leave
26	23-11-2020		**University Exam V Semester UG Begin**

Subject Code:	**5B07 MAT**
Subject Name:	**Differential Equations, Laplace Transform and Fourier Series**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of the Teacher:	**Prija V**

Module I: First Order Differential Equations (20 Hours)
Basic concepts and ideas, Separable differential equations, Exact differential equations.
Integrating factors, Linear differential equations. Bernoulli equation, Orthogonal trajectories of curves, Existence and uniqueness of solutions (Sections 1.1, 1.3, 1.5, 1.6, 1.8
and 1.9 of Text 1). Systems of Differential Equations - Introductory examples, Basic concepts and theory. (Sections 3.1, 3.2)

Module II: Second Order Linear Differential Equations (25 Hours)
Homogeneous linear equations of second order, Second order homogeneous equation with
constant coefficients, Case of complex roots, Complex exponential function, Differential
operators, Euler-Cauchy equation, Existence and uniqueness theory (proof omitted), Wronskian, Non homogeneous equations, Solution by undetermined coefficients, Solution
by variation of parameters. (Sections 2.1 to 2.10 except 2.5)

Module III: Laplace Transform (22 Hours)
Laplace transform, Inverse transform, Linearity, Transforms of derivatives and integrals,
Unit step function, second shifting theorem, Dirac's Delta function, Differentiation of integration of transforms, Convolution, Partial Fractions. Differential equations. (Sections 5.1 to 5.6)

Module IV: Fourier Series (23 Hours)
Periodic functions. Trigonometric series, Fourier series, Functions of any period p=2L, Even
and odd functions, Half range expansion, Fourier integrals (Sections 10.1 to 10.4 and 10.8).

Text : E. Kreyzig, Advanced Engineering Mathematics, 8th Edition, John Wiley, 2006.
References:
1. S.L. Ross, Differential Equations, 3rd Edition, Wiley.

2. G. Birkhoff and G.C. Rota, Ordinary Differential Equations, Wiley and Sons, 3rd Edition
3. E.A. Coddington, An Introduction to Ordinary Differential Equtions, Printice Hall
4. W.E. Boyce and R.C.Diprima, Elementary Differential Equations and Boundary Value
Problems, 9th Edition, Wiley.

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	01-06-2020 To 05-06-2020	1	Basic concepts and ideas.
		2	Separable differential equations.
		3	Example problems, Exercise Questions.
		4	Exact differential equations.
		5	Example problems, Exercise Questions.
2	08-06-2020 To 12-06-2020	6	Exercise Questions,Homework.
		7	Integrating factors
		8	Example problems, Exercise Questions.
		9	Class Test
		10	Linear differential equations
3	15-06-2020 To 19-06-2020	11	Example problems, Exercise Questions.
		12	Assignment.
		13	Bernoulli equation.
		14	Example problems, Exercise Questions. Homework.
		15	Example problems, Exercise Questions.
4	22-06-2020 To 26-06-2020	16	Orthogonal trajectories of curves. Example problems, Exercise Questions.
		17	Exercise Questions, homework.
		18	Existence and uniqueness of solutions- Theorems and Proofs.
		19	Systems of Differential Equations - Introductory examples, Basic concepts
		20	Example problems, Exercise Questions.
5	29-06-2020	21	Class Test.
		22	Laplace transform- Basic Concepts.

No of Weeks	Dates	Session	Topic
	To 03-07-2020	23	Inverse transform.
		24	Linearity
		03 July	St. Thomas Day
6	06-07-2020 To 10-07-2020	25	Class test
		26	Transforms of derivatives and integrals,
		27	Example problems, Exercise Questions.
		28	Unit step function
		29	Example problems, Exercise Questions.
7	13-07-2020 To 17-07-2020	30	second shifting theorem
		31	Example problems, Exercise Questions.
		32	Dirac's Delta function
		33	Homework
		34	Differentiation of integration of transforms,
8	20-07-2020 To 24-07-2020	20 July	KarkkidakaVavu
		35	Class test.
		36	Convolution- Example problems, Exercise Questions.
		37	Example problems, Exercise Questions. Homework.
		38	Partial Fractions, Differential equations. Example problems, Exercise Questions.
9	27-07-2020 To 31-07-2020	39	Homogeneous linear equations of second order- Examples,Definition.
		40	Second order homogeneous equation with constant coefficients- Example problems, Exercise Questions.
		41	Example problems, Exercise Questions. Homework.
		42	Euler-Cauchy equation- Example problems, Exercise Questions,Homework.
		31 July	Bakrid
10	03-08-2020 To 07-08-2020	43	Class test
		44	Existence and uniqueness theory
		45	Example problems, Exercise Questions. Homework
		46	Differentialoperators- Example problems, Exercise Questions, Homework
		47	Non homogeneous equations
11	10-08-2020	48	Assignment

No of Weeks	Dates	Session	Topic
	To 14-08-2020	49	Solution by undetermined coefficients
		50	Example problems, Exercise Questions. Homework
		51	Solution by variation of parameters
		52	Solution by variation of parameters- Solution by variation of parameters
12	17-08-2020 To 21-08-2020	53	Class test
		54	Periodic functions- definitions, examples
		55	Trigonometric series-definitions
		56	Example problems, Exercise Questions. Homework
		57	Fourier series- definitions
13	24-08-2020 To 28-08-2020	58	Example problems, Exercise Questions. Homework
		59	Example problems, Exercise Questions. Homework
		60	Functions of period p=2π
		61	Example problems, Exercise Questions. Homework
		28 August	AyyankaliJayanthi
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	Class test
		63	Even and odd functions,
		64	Example problems, Exercise Questions. Homework
		10 September	SreekrishnaJayanthi
		65	Example problems, Exercise Questions. Homework
16	14-09-2020 To 18-09-2020	66	Exercise Questions.
		67	Functions of any period p=2L
		68	Example problems, Exercise Questions. Homework
		69	Example problems, Exercise Questions. Homework
		70	Class test

No of Weeks	Dates	Session	Topic
17	21-09-2020 To 25-09-2020	21 September	Sreenarayana Guru Samadhi
		71	Half range fourier cosine series.
		72	Example problems, Exercise Questions. Homework
		73	Example problems, Exercise Questions. Homework
		74	Assignment.
18	28-09-2020 To 02-10-2020	75	Assignment.
		29 September	**IV Semester UG University Exam**
			IV Semester UG University Exam
			IV Semester UG University Exam
			IV Semester UG University Exam
19	05-10-2020 To 09-10-2020		**IV Semester UG University Exam**
			IV Semester UG University Exam
			IV Semester UG University Exam
			IV Semester UG University Exam
			IV Semester UG University Exam
20	12-10-2020 To 16-10-2020	76	Half range expansion-basic concepts
		77	Half range fourier cosine series.
		78	Half range fourier sine series.
		79	Example problems, Exercise Questions. Homework
		80	Fourier integrals
21	19-10-2020 To 23-10-2020	81	Example problems, Exercise Questions. Homework
		82	Example problems, Exercise Questions. Homework
		83	Class test
		84	Seminar- Exercise Questions.
		85	Seminar- Exercise Questions.
22	26-10-2020 To 30-10-2020	26October	Vijayadasami
		86	viva
		87	viva
		29October	Miladi-I-Sherif
		88	Revision.
23	02-11-2020 To 06-11-2020	89	Revision.
		90	Revision.
			V Semester UG Internal Exams
			V Semester UG Internal Exams

No of Weeks	Dates	Session	Topic
			V Semester UG Internal Exams
24	09-11-2020 To 13-11-2020		**V Semester UG Internal Exams**
			V Semester UG Internal Exams
			Study Leave
			Study Leave
			Study Leave

Subject Code:	**5B08MAT**
Subject Name:	**Vector Calculus**
No. of Credits:	**4**
No. of Contact Hours:	**72**
Hours per Week:	**4**
Name of the Teacher:	**Ajeena Joseph**

Syllabus:

Module – I (18 hours)
Lines and planes in space, Vector functions, arc length and unit tangent vector **T,** curvature and unit normal vector **N,** torsion and unit binormal vector **B.**
(Sections 12.5, 13.1, 13.3, 13.4, 13.5 of text 1).

Module – II (24 hours)
Directional derivatives and gradient vectors, tangential planes and differentials, extreme values and saddle points, Lagrange multipliers, Partial derivatives with constrained variables, Taylor's formula for two variables. (Sections 14.5, 14.6, 14.7, 14.8, 14.10 of text 1)
Divergence of a vector field, curl of a vector field (sections 8.10 and 8.11 of text 2)

Module - III (15hours)
Line integrals, Vector fields, Work, Circulation, Flux, Path independence, conservative fields , potential functions, Green's theorem in the plane. (Sections 16.1, 16.2, 16.3, 16.4 of Text 1).

Module -IV (15 hours)
Surface area and surface integrals, Parametrized surfaces, Stoke's theorem.(theorem without proof), Divergence theorem and Unified theory (with out proof). (Sections 16.5, 16.6, 16.7, 16.8 of Text 1)

Text: M.D Weir, J. Hass and F.G Giordano ; " Thoma's Calculus" 11 th edition, Pearson Education.
Text: E.Kreyzig, Advanced Engineering Mathematics, 8 th edition, John Wiley, 2006.

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	01-06-2020 To 05-06-2020	1	Equation of lines
		2	Problems and examples
		3	Equation of plane
		4	Problems
2	08-06-2020 To 12-06-2020	5	Introduction to curves in space
		6	Properties of curves in space
		7	Equation of tangent to a curve
		8	Class test
3	15-06-2020 To 19-06-2020	9	Arc length in space and examples
		10	Curvature of a curve
		11	Problem to find curvature
		12	Normal vector to a curve
4	22-06-2020 To 26-06-2020	13	Binormal vector
		14	Different formulas to find tangent ,normal and binormal vector of a curve
		15	Class test
		16	Problems
5	29-06-2020 To 03-07-2020	17	Introduction to directional derivative
		18	Problems
		19	Problems
		03 July	St. Thomas Day
6	06-07-2020 To 10-07-2020	20	Gradient vectors
		21	Tangent plane and normal plane
		22	Problems to find tangent and normal plane
		23	Introduction to differential of a function
7	13-07-2020 To 17-07-2020	24	Seminar
		25	Seminar
		26	Class test
		27	Extreme values and saddle points
8	20-07-2020 To 24-07-2020	20 July	KarkkidakaVavu
		28	Problems
		29	Lagrange multipier theorem with one constraint
		30	Lagrange multiplier theorem with two constraint
9	27-07-2020	31	Problems

No of Weeks	Dates	Session	Topic
	To 31-07-2020	32	Problems
		33	Problems
		31 July	Bakrid
10	03-08-2020 To 07-08-2020	34	Problems
		35	Assignment
		36	Problems
		37	Class test
11	10-08-2020 To 14-08-2020	38	Problems on line integrals
		39	Vector fields
		40	Work done by a force
		41	Problems to find work done by a force
12	17-08-2020 To 21-08-2020	42	Gradient and flux
		43	Gradient and flux
		44	Gradient and flux
		45	Class test
13	24-08-2020 To 28-08-2020	46	Path independence
		47	Conservative field and potential functions
		48	Conservative field and potential functions
		28 August	AyyankaliJayanthi
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	49	Assignment
		50	Green's theorem
		51	Green's theorem
		10 September	SreekrishnaJayanthi
16	14-09-2020 To 18-09-2020	52	Problems related to Green's theorem
		53	Introduction to surface
		54	Surface area
		55	Problems to find out surface area
17	21-09-2020 To 25-09-2020	21 September	Sreenarayana Guru Samadhi
		56	Parametrization of surfaces
		57	Problems to find out surface area using parametrization
		58	Class test
18	28-09-2020	59	Problems

No of Weeks	Dates	Session	Topic
	To 02-10-2020	29 September	**IV Semester UG University Exam**
			IV Semester UG University Exam
			IV Semester UG University Exam
			IV Semester UG University Exam
19	05-10-2020 To 09-10-2020		**IV Semester UG University Exam**
			IV Semester UG University Exam
			IV Semester UG University Exam
			IV Semester UG University Exam
			IV Semester UG University Exam
20	12-10-2020 To 16-10-2020	60	Stoke's theorem
		61	Stoke's theorem
		62	Problems on Stoke’s theorem
		63	Divergence theorem
21	19-10-2020 To 23-10-2020	64	Unified theory
		65	Problems
		66	Assignment
		67	Class test
22	26-10-2020 To 30-10-2020	26 October	Vijayadasami
		68	Seminar
		69	Seminar
		29October	Miladi-I-Sherif
		70	Revision
23	02-11-2020 To 06-11-2020	71	Revision
		72	Revision
			V Semester UG Internal Exams
			V Semester UG Internal Exams
			V Semester UG Internal Exams
24	09-11-2020 To 13-11-2020		**V Semester UG Internal Exams**
			V Semester UG Internal Exams
			Study Leave
			Study Leave
			Study Leave

Subject Code:	**5B09MAT**
Subject Name:	**GRAPH THEORY**
No. of Credits:	**3**
No. of Contact Hours:	**72**
Hours per Week:	**4**
Name of the Teacher:	**NOBLE PHILIP**

5B09 MAT: Graph Theory

Module I – Basic Results (18 Hours)
Introduction, Basic Concepts, Subgraphs, Degrees of Vertices, Paths and Connectedness,
Line Graphs (Whitney's theorem without proof), Operations on Graphs.
(Sections 1.1 to 1.8 except 1.6)

Module II –Connectivity, Trees (24 Hours)
Introduction, Vertex Cuts and Edges Cuts, Connectivity and Edge Connectivity (Whitney's
theorem without proof), Blocks, Introduction, Definition, Characterization, and Simple
Properties, Centers and Centroids, Counting the Number of Spanning Trees, Cayley's Formula. (Sections 3.1 to 3.4 and 4.1 to 4.5)

Module III – Independent Sets, Eulerian and Hamiltonian Graphs (18 Hours)
Introduction, Vertex-Independent Sets and Vertex Coverings, Edge-Independent Sets, Introduction, Eulerian Graphs, Hamiltonian Graphs, Hamilton's "Around the World" Game. (Sections 5.1 to 5.3, and 6.1 to 6.3 and 6.3.1)

Module IV – Directed Graphs (12 Hours)
Introduction, Basic Concepts, Tournaments (Sections 2.1 to 2.3)

Text: R. Balakrishnan and K. Ranganathan, A Text Book of Graph Theory, 2nd Edition, Springer

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	01-06-2020 To 05-06-2020	1	Introduction to graph theory
		2	**Applications of graph theory**
		3	Basic concepts
		4	Basic concepts
		5	**Subgraphs**
2	08-06-2020 To 12-06-2020	6	**Examples**
		7	**Examples**
		8	**Degrees of vertices**
		9	**Degrees of vertices**
		10	**Examples**
3	15-06-2020 To 19-06-2020	11	**Path**
		12	**Connectedness**
		13	**Connectedness**
		14	**Examples**
		15	**Examples**
4	22-06-2020 To 26-06-2020	16	**Line Graph**
		17	Line Graph
		18	Examples
		19	Operations of Graphs
		20	Operations of Graphs
5	29-06-2020 To 03-07-2020	21	Class test
		22	**Connectivity**
		23	**Introduction**
		24	Vertex Cuts
		03 July	St. Thomas Day
6	06-07-2020 To 10-07-2020	25	**Examples**
		26	**Edge cuts**
		27	**Examples**
		28	**Connectivity**
		29	**Examples**
7	13-07-2020 To 17-07-2020	30	Edge Connectivity
		31	**Examples**
		32	**Blocks**
		33	**Introduction**
		34	**Definition**

No of Weeks	Dates	Session	Topic
8	20-07-2020 To 24-07-2020	20 July	KarkkidakaVavu
		35	Characterization
		36	Simple Properties
		37	Centers
		38	Examples
9	27-07-2020 To 31-07-2020	39	Centroids
		40	Counting the Number of spanning trees
		41	Cayley's Formula
		42	Class test
		31 July	Bakrid
10	03-08-2020 To 07-08-2020	43	**Introduction**
		44	**Vertex Independent sets**
		45	**Vertex Independent sets**
		46	Vertex Coverings
		47	**Vertex Coverings**
11	10-08-2020 To 14-08-2020	48	**Edge Independent Sets**
		49	Introduction
		50	**Eulerian Graphs**
		51	**Examples**
		52	Hamiltonian Graphs
12	17-08-2020 To 21-08-2020	53	Examples
		54	Hamilton's Around the World Game
		55	Examples
		56	Examples
		57	**Class test**
13	24-08-2020 To 28-08-2020	58	Directed Graphs
		59	Directed Graphs
		60	**Introduction**
		61	Basic Concepts
		28 August	AyyankaliJayanthi
14	31-08-2020 To 04-09-2020		Onam Holiday
			Onam Holiday
			Onam Holiday
			Onam Holiday
			Onam Holiday
15	07-09-2020 To	62	**Directed Graphs –Examples**
		63	**Examples**
		64	**Theorem**

No of Weeks	Dates	Session	Topic
	11-09-2020	10 September	SreekrishnaJayanthi
		65	Theorem
16	14-09-2020 To 18-09-2020	66	Examples
		67	Tournaments
		68	**Tournaments**
		69	**Examples**
		70	**Examples**
17	21-09-2020 To 25-09-2020	21 September	Sreenarayana Guru Samadhi
		71	Class Test
		72	Rivision
		73	Rivision
		74	**Rivision**
18	28-09-2020 To 02-10-2020	75	Rivision
		29 September	**IV Semester UG University Exam**
			IV Semester UG University Exam
			IV Semester UG University Exam
			IV Semester UG University Exam
19	05-10-2020 To 09-10-2020		**IV Semester UG University Exam**
			IV Semester UG University Exam
			IV Semester UG University Exam
			IV Semester UG University Exam
			IV Semester UG University Exam
20	12-10-2020 To 16-10-2020	76	**Problem solving**
		77	**Question paper discussion**
		78	**Question paper discussion**
		79	**Class test**
		80	**Class test**
21	19-10-2020 To 23-10-2020	81	**Discussion**
		82	**Rivision**
		83	**Rivision**
		84	**Rivision**
		85	**Rivision**
22	26-10-2020 To 30-10-2020	26 October	Vijayadasami
		86	**Class test**
		87	**Class test**
		29October	Miladi-I-Sherif
		88	**Class test**
23	02-11-2020	89	**Class test**
		90	**Class test**

No of Weeks	Dates	Session	Topic
	To 06-11-2020		V Semester UG Internal Exams
			V Semester UG Internal Exams
			V Semester UG Internal Exams
24	09-11-2020 To 13-11-2020		V Semester UG Internal Exams
			V Semester UG Internal Exams
			Study Leave
			Study Leave
			Study Leave

Subject Code:	**5D02 MAT**
Subject Name:	**Open Course – QUANTITATIVE ARITHMETIC AND REASONING**
No. of Credits:	**2**
No. of Contact Hours:	**36**
Hours per Week:	**2**
Name of the Teacher:	**REMYA RAJ**

SYLLABUS

Module – I (18 Hours)
Average, Problems on ages, Profit and loss, Ratio and proportion, Chain rule, Time and work. (Chapters 6, 8, 11, 12, 14, 15)

Module–II (18 Hours)
Time and distance, Problems on Trains, Boats and streams, Calendar, Clocks, Permutations and combinations, Heights and distances. (Chapters 17, 18, 19, 27, 28, 30, 34)

Text: R.S. Aggarwal, Quantitative Aptitude for Competitive Examinations, S. Chand Company Ltd, 7th Edition.

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	01-06-2020 To 05-06-2020	1	Average, problems
		2	problems
2	08-06-2020 To 12-06-2020	3	Problems on ages
		4	problems
3	15-06-2020 To 19-06-2020	5	problems
		6	Profit and Loss- Profit ,problems
4	22-06-2020 To 26-06-2020	7	problems
		8	Loss-problems
5	29-06-2020 To 03-07-2020	9	Problems
		03 July	St. Thomas Day
6	06-07-2020	10	Class test

No of Weeks	Dates	Session	Topic
	To 10-07-2020	11	Ratio and proportion-Ratio,problems
7	13-07-2020 To 17-07-2020	12	Problems
		13	Problems
8	20-07-2020 To 24-07-2020	20 July	KarkkidakaVavu
		14	Proportion-problems
9	27-07-2020 To 31-07-2020	15	problems
		31 July	Bakrid
10	03-08-2020 To 07-08-2020	16	Chain rule-problems
		17	Problems
11	10-08-2020 To 14-08-2020	18	problems
		19	Class test
12	17-08-2020 To 21-08-2020	20	Time and Work-problems
		21	Problems
13	24-08-2020 To 28-08-2020	22	Problems
		28 August	AyyankaliJayanthi
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	23	Time and distance-problems
		10 September	SreekrishnaJayanthi

No of Weeks	Dates	Session	Topic
16	14-09-2020 To 18-09-2020	24	Problems
		25	Problems on trains
17	21-09-2020 To 25-09-2020	21 September	Sreenarayana Guru Samadhi
		26	Problems
		27	Boats and Streams
18	28-09-2020 To 02-10-2020	28	Problems
		29 September	**IV Semester UG University Exam**
			IV Semester UG University Exam
			IV Semester UG University Exam
			IV Semester UG University Exam
19	05-10-2020 To 09-10-2020		**IV Semester UG University Exam**
			IV Semester UG University Exam
			IV Semester UG University Exam
			IV Semester UG University Exam
			IV Semester UG University Exam
20	12-10-2020 To 16-10-2020	29	Calendar-problems
		30	Problems
21	19-10-2020 To 23-10-2020	31	Clocks -problems
		32	Problems
22	26-10-2020 To 30-10-2020	26 October	Vijayadasami
		33	Problems
		29October	Miladi-I-Sherif
		34	Revision
23	02-11-2020 To 06-11-2020	35	Revision
		36	Class test
			V Semester UG Internal Exams
			V Semester UG Internal Exams
			V Semester UG Internal Exams
24	09-11-2020 To		**V Semester UG Internal Exams**
			V Semester UG Internal Exams
			Study Leave

No of Weeks	Dates	Session	Topic
	13-11-2020		**Study Leave**
			Study Leave