



Criterion 1 – Curricular Aspects

Key Indicator	1.1	Curriculum Design and Development
Metric	1.1.2	Percentage of Programmes where syllabus revision was carried out during academic year 2023-24

DEPARTMENT OF MATHEMATICS

S. No.	Programme Code	Programme name	Year of Introduction	Year of revision	Percentage of Syllabus content added or replaced
1.	164	B.Sc. Mathematics (Full Time)	2017-18	2023-24	28.55%
2.	359	M.Sc.–Mathematics (Full Time)	2014-15	2023-24	44.43 %

S.No	Contents
1.	Minutes of Board of Studies
2.	Extracts of minutes of the Academic Council Meeting
3.	Curiculum and Syllabus of the programme – Before Revision
4.	Curiculum and Syllabus of the programme – After Revision

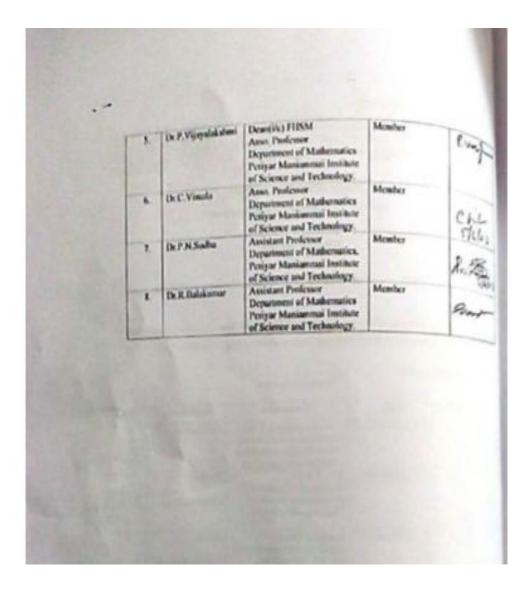
Legend :	Highlighted Color - Red	_	Indicates	courses	which	are	removed
			from sylla	bus befor	e revisio	on	

Highlighted Color - Green – Indicates courses which are added into syllabus after revision

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A. FEEDBACK ON CURRICULAR ASPECTS

The feedback was collected and analyzed during 2021-2022 and 2022-2023 from the following stake holders

The state

- Teachers
- Employers
- · Alumni students
- Students

In addition, the feedback from Academic Expert, Teachers, Alumni and Students who participated in Department Advisory Committee (DAC) Meeting were presented. The action taken for the feedbacks are given as "Remarks" in Table I.

B. CURRICULUM INTERVENTION BASED ON CO ATTAINMENT

The CO attainment and PO attainment for the courses were presented to the members and were discussed.

C. PRESENTATION OF CURRICULUM AND SYLLABUS

All the courses which are framed by the Department of Mathematics are presented individually. The deletion, addition and introduction of new courses related details are tabulated for all courses in the following table.

Table I: Discussions on courses with actions as remarks B. Sc. Mathematics

No	Sem	Course type	Course Name (Proposed)	Course content Deletion/ Addition/New	Percentage of change	Remarks
L.	1	CC	Algebra & Trigonometry	No Change	0%	
2	1	CC	Differential Calculus	No Change	0%	
3,	11	CC	Analytical Geometry 3-D and Integral Calculus	Change	20 %	Feedback received from stake holders
4.	П	CC	Sequence and Series	No Change	0%	stake noticers
6.	m	CC	Differential Equations and Applications	Change	40%	Feedback received from stake holders
		cc	Vector Calculus and Applications	Change	60%	Feedback received from stake holders
7.	IV	сс	Object Oriented Programming with C++	New Course	100%	Feedback received from BOS Expert

						members
-		1			40 %	Feedback
8.	IV	CC	Fourier Series and Transforms	Change	40 %	received from stake holders
9.	v	cc	Abstract Algebra	Change	40%	Feedback received from stake holders
10.	v	cc	Real Analysis	Change	40%	Feedback received from stake holders
11.	v	cc	Number Theory	Change	60%	Feedback received from stake holders
12	v	DSE	Graph Theory	Change	50%	Feedback received from stake holders
13.	V	DSE	Mathematical Modeling	No Change	0%	-
14.	v	DSE	Numerical Methods with MATLAB	New Course	100%	Feedback received from BOS Expert members
15.	v	DSE	Discrete Mathematics	Change	50%	Feedback received from stake holders
16.	VI	cc	Complex Analysis	Change	40%	Feedback received from stake holders
17.	VI	cc	Mechanics	Change	40%	Feedback received from stake holders
18.	ш	DSC	Statistics for Data Science - I	New Course	100%	Feedback received from BOS Expert members
19.	ш	DSC	Statistics for Data Science - 1 - Lab using R-Programming	New Course	100%	Feedback received from BOS Expert members
20.	IV	DSC	Statistics for Data Science - II	New Course	100%	Feedback received from BOS Expert
21.	IV	DSC	Statistics for Data Science – II Lab using R-Programming	New Course	100%	Feedback received from BOS Expert
22.	VI	DSE	Optimization Techniques	No Change	0%	members

23.	VI	DSE	Industrial Mathematics 4.0	No Change	0%	-
24.	VI	DSE	Introduction to Machine Learning	New Course	100%	Feedback received from BOS Expert members
25.	VI	DSE	Astronomy	No Change	0%	
26.	VI	DSE	Stochastic Processes	No Change	0%	
27.	11	SEC	Quantitative Aptitude - I	No Change	0%	
28.	Ш	SEC	Quantitative Aptitude - II	No Change	0%	+
19.	IV	SEC	Vedic Mathematics – I	New Course	100%	Feedback received from BOS Expert members
30.	v	SEC	Vedic Mathematics - II	New Course	100%	Feedback received from BOS Expert members
31.	I	Bridge Course	Foundation Course	New Course	100%	Feedback received from BOS Expert members
32.	v	NME	Mathematics for Finance	New Course	100%	Feedback received from BOS Expert members

LIST OF NEW COURSES
 ible II: NEWLY INTRODUCED COURSES IN REGULATION 2023 B.Sc. Mathematics 34.4%

S. No	Name of the course	Remarks
1.	Vedic Mathematics - I V	Introduced as per recommendations of BOS
2.	Vedic Mathematics - II	Introduced as per recommendations of BOS
3.	Introduction to Machine Learning	Introduced as per feedback received from students and industrialist
4.	Numerical Methods with MATLAB 🗸	Introduced as per feedback received from students
5.	Statistics for Data Science -I Lab using R- Programming	Introduced as per recommendations of BOS
6.	Statistics for Data Science - 1	Introduced as per recommendations of BOS
7.	Statistics for Data Science - II	Introduced as per recommendations of BOS
8.	Statistics for Data Science - II Lab using R- Programming	Introduced as per recommendations of BOS
9.	Object Oriented Programming with C++	Introduced as per feedback received from students
10.	Foundation Course	Introduced as per TANSCHE
11.	Mathematics for Finance	Introduced as per TANSCHE

5

A FEEDBACK ON CURRICULAR ASPECTS

The feedback was collected and analyzed during 2021-2022 and 2022-2023 from the following stake holders

- Teachers
- Employers
- Industrialist
 Alumni students
- Students
- A Second me

In addition, the feedback from Academic Expert, Teachers, Alumni and Students who participated in Department Advisory Committee (DAC) Meeting were presented. The action taken for the feedbacks are given as "Remarks" in Table I.

B. CURRICULUM INTERVENTION BASED ON CO ATTAINMENT

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C. PRESENTATION OF CURRICULUM AND SYLLABUS

All the courses which are framed by the Department of Mathematics are presented individually. The deletion, addition and introduction of new courses related details are tabulated for all courses in the following table.

S.No	Sem	Course Name	Course content Deletion/Addition/New	Percentage of Change	Remarks
1	1	Linear Algebra	New Course	100%	Feedback given by BoS Subject experts
2	1	Real Analysis		20%	Feedback received from stake holders
3	1	Ordinary Differential Equations		80%	Feedback received from stake holders
4	1	Graph Theory	No Change	0%	-
5	i	Mathematical Statistics		40%	Feedback received from stake holders
		Fuzzy sets and their applications		40%	Feedback given by BoS Subject experts

M.Sc. Mathematics

Pable 1. Discussions on courses with actions as remar-

_	T	AI and Machine Learning	New Course	100%	Feedback gives by BoS Subject expens
6	1	Computer Programming (C++ Theory and Lab)	No Change	0%	-
		Number Theory and Cryptography	-	60%	Feedback received from stake holders
		Formal Languages and Automata Theory		60%	Feedback received from stake holders
7	11	Advanced Algebra	New Course	100%	Feedback given by BoS Subject experts
8	Ш	Complex Analysis	•	40%	Feedback received from stake holders
9	u	Partial Differential Equations	•	40%	Feedback give by DAC members and BoS Subject experts
10	11	Advanced Numerical Methods		60%	Feedback received from stake holders
11	Ш	Resource Management Techniques		60%	Feedback received from stake holders
2		Data Science using R programming	New Course	100%	Feedback give by DAC members and BoS Subject experts
		Python for Mathematics	New Course	100%	Feedback give by BoS Subjo experts
12	п	Data Analysis using SPSS	No Change	0%	-
		Numerical Methods Practical using MATLAB	New Course	100%	Feedback give by BoS Subjo experts
		Data Analytics Practical with Python	New Course	100%	Feedback give by BoS Subje experts

-					
3	11	Research Methodology	New Course	100%	Feedback given by BoS Subject experts
4	.111	Topology	No Change	0%	-
15	ш	Measure theory and Integration	New Course	100%	Feedback given by BoS Subject experts
16	m	Functional Analysis	*	40%	Feedback given by BoS Subject experts
17	ш	Differential Geometry	•	60%	Feedback given by BoS Subject experts
18	111	Core Industry Module: Mathematics of Finance and Insurance	New Course	100%	Feedback given by BoS Subject experts
19		Fluid Dynamics	•	80%	Feedback given by BoS Subject experts
		Probability Theory	New Course	100%	Feedback given by BoS Subject experts
		Design and Analysis of Algorithms	New Course	100%	Feedback given by BoS Subject experts
20	IV	Project	No Change	0%	Only change in credit

1. LIST OF NEWLY INTRODUCED COURSES IN REGULATION 2023 (38,7%)

Table II Newly courses introduced

4

S.NO.	Course Name
1.	Linear Algebra
2.	Machine Learning and AI
3.	Advanced Algebra
4.	Data Science using R programming
5.	Python for Mathematics
6,	Numerical Methods Practical using MATLAB
7.	Data Analytics Practical with Python
8.	Research Methodology
9,	Measure theory and Integration
10,	Core Industry Module: Mathematics of Finance and Insurance
11.	Probability Theory
12.	Design and Analysis of Algorithms

2. Extracts of Minutes of the Academic Council Meeting-B.Sc Maths conducted on 08.07.2023

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MINUTES OF FORTY SECOND MEETING OF THE ACADEMIC COUNCIL

Date : 08.07.2023 Time : 10.30 A.M Venue: Richard Dawkine Hall Place : PMIST, Vallam – Thanjavur

The Forty Second Meeting of the Academic Council of the Periyar Maniammai Institute of Science & Technology (PMIST), Vallam, Thanjavur held on 08.07.2023 at 10.30 a.m.

Prof.S.Velusami, Hon'ble Vice-Chancellor, chaired the meeting.

The following Academic Council Members were present

1.	Dr.D.Aarthi Saravanan	Member
2.	Dr.A.Anand Jerard Sebastine	Member
3.	Dr.S.Arumugam	Member
4.	Dr.A.P.Aruna	Member
5.	Dr.P.Aruna	Member
6.	Dr.S.Asokan	Member
7.	Dr.P.Balakumar	Member
8.	Dr.S.Buvaneswari	Member
9.	Dr.P.Guru	Member
10.	Dr.K.Geetha	Member
11.	Dr.A.George	Member
12.	Dr.A.Manohar (Represented for Dr.B.Gomathi)	Member
13.	Dr.V.Hamsadhwani	Member
14.	Dr.R.Jayanthi	Member
15.	Dr.N.Jayanthi	Member
16.	Dr.J.Jeyachidra	Member
17.	Dr.D.Jeyasimman	Member
18.	Mr.I.Karthic Subramaniayan	Member
19.	Dr.R.Kathiravan	Member

51	Dr.D.Umameheswari	Member

52. Dr.P.Vijayalakshmi

ADDRESS BY THE VICE-CHANCELLOR

Hon'ble Chair Person welcomed all the internal & External Members of the Academic Council. He presented all the academic activities held in the campus after the previous meeting.

Member.

1. BUSINESS BROUGHT FORWARD BY THE VICE-CHANCELLOR

VC 42.1.1 TO CONSIDER AND APPROVE the confirmation of the minutes of the 41st Academic Council Meeting held on 10.12.2022.

Notes:

The Minutes of the 41st Academic Council Meeting held on 10.12.2022 were communicated to all members. The same was placed before the Board of Management Meeting held on 27.12.2022 and got approved; no dissent / corrections have been received from the members.

The matter is placed before the Academic Council for approval.

Resolution

RESOLVED TO APPROVE the confirmation of the minutes of the 41st Academic Council Meeting held on 10.12.2022.

VC 42.1.2 TO CONSIDER AND RATIFY the course works offered for the Research scholars registered in the academic year 2022-23 under Regulations 2022. Notes:

> The respective Doctoral Committees of the following departments have discussed and finalized the course work syllability for the Research Scholars registered in the academic year 2022-23. The list is given below:

FHSM B.Sc.-Maths 42.5.4

TO CONSIDER AND APPROVE the Curriculum and Syllabi for I to VI Semester for B.Sc.-Mathematics programme under Regulation 2023 and Proposed Value-Added Courses.

Notes:

The Board of Studies of Department of Mathematics recommended the Curriculum and Syllabi for I to VI Semester for B.Sc.-Mathematics programme under full time (Regulation 2023) for the candidates admitted from 2023 –24 onwards.

Curriculum and Syllabus is with 35% revision from previous syllabus. The syllabus revision included feedback on curricular aspects from students, teachers, Industrialist, employers and alumni. The syllabus has courses having focus on employability/entrepreneurship / skill development. The new courses offered by the department are

S.No	Name of the course
1.	Vedic Mathematics – I
2.	Vedic Mathematics – II
3.	Introduction to Machine Learning
4.	Numerical Methods with MATLAB
5.	Statistics for Data Science - I
6.	Statistics for Data Science –I Lab using R-Programming
7.	Statistics for Data Science - II
8.	Statistics for Data Science – II Lab using R-Programming
9.	Object Oriented Programming with C++
10.	Foundation Course
11.	Mathematics for Finance

Extracts of the Minutes of the 42ndAcademic Council Meeting dated

08.07.2023

DEPARTMENT OF MATHEMATICS

 FHSM
 TO CONSIDER AND APPROVE the Curriculum and Syllabi for I to IV

 M.Sc.-Maths
 Semester for M.Sc.-Mathematics programme under Regulation 2023 and

 Proposed Value-Added Courses.

Notes:

The Board of Studies of Department of Mathematics recommended the Curriculum and Syllabi for I to IV Semester for M.Sc.-Mathematics programme under full time (Regulation 2023) for the candidates admitted from 2023–24 onwards. Curriculum and Syllabus is with 39% revision from previous syllabus. The syllabus revision included feedback on curricular aspects from students, teachers, Industrialist, employers and alumni. The syllabus has courses having focus on employability / entrepreneurship / skill development.

The new courses offered by the department are

SI.No.	Course Name
1	Linear Algebra
2	Machine Learning and Al
3	Advanced Algebra
4	Data Science using R programming
5	Python for Mathematics
6	Numerical Methods Practical usingMAT LAB
7	Data Analytics Practical with Python
8	Research Methodology
9	Measure theory and Integration
10	Core Industry Module: Mathematics of Finance and Insurance
11	Probability Theory
12	Design and Analysis of Algorithms

3.a. Curriculum and Syllabus of B.Sc Maths – Before Revision

Category	Code	Course Name	L	Т	Р	SS	Η	С
Part – I	XGT101/XFT101	Tamil – I/ Foundational Tamil- I	3	0	0	0	3	3
Part – II	XGE102	English – I	3	0	0	0	3	3
Core -1	XMT103	Differential Calculus and Trigonometry	4	1	0	0	5	4
Core -2	XMT104	Analytical geometry 3-D and Integral Calculus	4	1	0	0	5	4
Allied -1	XPG105	Physics – I	3	1	0	0	4	4
Allieu - I	XPG106	Physics Practical - I	0	0	4	0	4	2
UMAN - 1	XUM001	Human Ethics, Values, Rights and Gender Equality	1	0	0	1	2	1
		Mentoring	0	0	0	0	1	0
		Library/E-Library	0	0	0	0	1	0
		Extension Activities (NSS, NCC, NSO,RRC and YRC)	0	0	0	0	2	0
		Total	16	3	4	1	30	21

B.Sc. (Mathematics) REGULATION – 2022 SEMESTER – I

	SEMESTER II									
Category	Code	Course Name	L	Τ	Р	SS	Η	С		
Part – I	XGT201/ XFT201	Tamil – II/ Foundational Tamil – II	3	0	0	0	3	3		
Part – II	XGE202	English – II	3	0	0	0	3	3		
Core-3	XMT203	Classical Algebra	3	1	0	0	4	4		
Core-4	XMT204	Sequence and Series	3	1	0	0	4	4		
Allied -2	XPG205	Physics – II	3	1	0	0	4	4		
	XPG206	Physics Practical - II	0	0	4	0	4	2		
SEC -1	XMT207	Skill Based Elective Course - 1	2	0	0	0	2	2		
UMAN - 2	XUM002	Environmental Studies	1	0	0	1	2	1		
		Field Visit/Industrial Visit	0	0	0	0	0	2		
		Mentoring	0	0	0	0	1	0		
		Library/E-Library	0	0	0	0	1	0		
		Extension Activities (NSS, NCC, NSO, RRC and YRC)	0	0	0	0	2	0		
	Total				4	1	3 0	2 5		

		SEMESTER III						
Category	Code	Course Name	L	Т	Р	SS	Η	С
Core -5	XMT301	Differential Equations and Laplace Transforms	3	1	0	0	5	4
Core -6	XMT302	Vector Calculus, Fourier Series and Fourier Transforms	3	1	0	0	5	4
	XMT303	Mathematical Statistics - 1	3	1	0	0	5	4
Allied -3	XMT304	Mathematical Statistics Practical -1	0	0	4	0	4	2
GE - 1		Open Elective- I	3	0	0	0	3	3
SEC - 2	XMT305	Skill Based Elective Course –2- Quantitative Aptitude - II	2	0	0	0	2	2
UMAN -3	XUM003	Disaster Management	1	0	0	1	2	1
		Mentoring	0	0	0	0	1	0
		Library/E-Library	0	0	0	0	1	0
		Extension Activities (NSS, NCC, NSO, RRC and YRC)	0	0	0	0	2	0
		15	3	4	1	30	20	

SEMESTER IV									
Category	Code	Course Name	L	Т	P	SS	Η	С	
Core –7	XMT401	Abstract Algebra	3	1	0	0	5	4	
Core -8	XMT402	Mechanics	3	1	0	0	5	4	
Allied 4	XMT403	Mathematical Statistics – 2	3	1	0	0	5	4	
Allied - 4 XMT404		Mathematical Statistics Practical – 2	0	0	4	0	4	2	
GE- 2		Open Elective- 2	3	0	0	0	3	3	
SEC – 3	XMT405	Skill Based Elective Course –3- Quantitative Aptitude - III	2	0	0	0	2	2	
UMAN - 4	XUM004	Introduction to Entrepreneurship Development	1	0	0	1	2	1	
		Mentoring	0	0	0	0	1	0	
		Library/E-Library	0	0	0	0	1	0	
		Extension Activities (NSS, NCC, NSO, RRC and YRC)	0	0	0	0	2	0	
		Total	15	3	4	1	30	20	

SEMESTER V								
Category	Code	Course Name	L	Τ	Р	SS	Η	С
Core -9	XMT501	Real Analysis	3	1	0	0	5	4
Core-10	XMT502	Discrete Mathematics	3	1	0	0	4	4
DSE – 1	XMT503	Discipline Specific Course - 1	4	1	0	0	5	5
DSE-2	XMT504	Discipline Specific Course - 2	4	1	0	0	5	5

GE -3		Open Elective- 3	3	0	0	0	3	3
NME	XMT505	Fundamentals of Data	1	1	0	0	2	2
		Science & R Programming						
SEC-4	XMT506	Skill Based Elective Course –4-	2	0	0	0	2	2
	AWI1500	Quantitative Aptitude -IV						
IPT	XMT507	IPT	0	0	0	0	0	4
		Mentoring	0	0	0	0	1	0
		Library/E-Library	0	0	0	0	1	0
		Extension Activities (NSS, NCC, NSO,RRC and YRC)	0	0	0	0	2	0
		Total	20	5	0	0	30	29

		SEMESTER VI						
Category	Code	Course Name	L	Τ	Р	SS	Η	С
Core -11	XMT601	Complex Analysis	3	1	0	0	5	4
Core -12	XMT602	Operations Research	3	1	0	0	4	4
DSE - 3	XMT603	Discipline Specific Course - 3	4	1	0	0	5	5
DSE - 4	XMT604	Discipline Specific Course - 4	4	1	0	0	5	5
Project	XMT605	Project	1	4	0	0	5	6
UMAN - 5	XUM005	Cyber Security	1	0	0	1	2	1
		Mentoring	0	0	0	0	1	0
		Library/E-Library	0	0	0	0	1	0
		Extension Activities (NSS, NCC, NSO,RRC and YRC)	0	0	0	0	2	2
		Total	16	8	0	1	30	27

Note:

L – Lecture SS – Self Study T – Tutorial H – Hours P – Practical C – Credits

LIST OF SKILL BASED ELECTIVE COURSES

Category	Semester	Code	Course Name	L	Т	Р	H	С
SEC -1	II	XMT207	Quantitative Aptitude – I	2	0	0	0	2
SEC -2	III	XMT305	Quantitative Aptitude - II	2	0	0	0	2
SEC -3	IV	XMT405	Quantitative Aptitude - III	2	0	0	0	2
SEC -4	V	XMT506	Quantitative Aptitude – IV	2	0	0	0	2

LIST OF DISCIPLINE SPECIFIC ELECTIVE COURSES

Semester-V

DSE – 1 (Any one of the following)

Category	Code	Course Name	L	Т	Р	Н	С
DSE1A	XMT503A	Numerical Methods	4	1	0	5	5
DSE1B	XMT503B	Number Theory	4	1	0	5	5

DSE – 2 (Any one of the following)

Category	Code	Course Name	L	Т	Р	Н	С
DSE2A	XMT504A	Graph Theory	4	1	0	5	5
DSE2B	XMT504B	Mathematical Modeling	4	1	0	5	5

Semester – VI

DSE – 3 (Any one of the following)

Category	Code	Course Name	L	Т	Р	Н	С
DSE3A	XMT603A	Fuzzy sets and its applications	4	1	0	5	5
DSE3B	XMT603B	Introduction to Industry 4.0	4	1	0	5	5

DSE – 4 (Any one of the following)

Category	Code	Course Name	L	Т	Р	Н	С
DSE4A	XMT604A	Astronomy	4	1	0	5	5
DSE4B	XMT604B	Stochastic Processes	4	1	0	5	5

	SE CODE	XGE102	L	Т	Р	SS	Н	С
COUR	SE NAME	English - I	3	0	0	0	3	3
C:P: A	- 3:0:0							
COUR	SE OUTCOM	ES:	Do	mai	n	L	evel	
CO1	Recall the basic	c grammar and using it in proper context	Cog	gniti	ve	Rem	embe g	erin
CO2	<i>Explain</i> the pro-	ocess of listening and speaking	Cog	gniti	ve	Unde		din
CO3	Adapt importar	at methods of reading	Cog	gniti	ve	Cr	eatin	g
CO4	<i>Demonstrate</i> th	ne basic writing skills	Cog	gniti	ve	Unde	erstan g	din
SYLL	ABUS	· · · · · · · · · · · · · · · · · · ·]	HOU	RS
UNIT	I Gramma	r						
i. Majo correct		tical categories ii. Notion of correctness and attitud	le to (erroi	•		9	
UNIT	II Listening	and speaking						
iii Imn	0	ning skills iv. Problems of listening to unfamiliar di	ialect	s			9	
-		ation and fluency in speaking vi. Intelligibility in sp					,	
UNIT				U				
vii Inti		\mathbf{O}						
vii. iiiu	roduction to read	ding skills viii. Introducing different types of texts	– nai	rativ	/e,		9	
	roduction to readutive, extrapolati	ding skills viii. Introducing different types of texts	– nai	rativ	/e,		9	
	tive, extrapolati	ding skills viii. Introducing different types of texts ve	– nai	rativ	/e,		9	
descrip UNIT	tive, extrapolatiIVBasics ofoduction to writ	ding skills viii. Introducing different types of texts ve Writing ing skills x. Aspects of cohesion and coherence xi.	Expa	andi	ng a		9	
descrip UNIT ix. Intro given s	tive, extrapolatiIVBasics ofoduction to writentence without	ding skills viii. Introducing different types of texts ve Writing ing skills x. Aspects of cohesion and coherence xi.	Expa	andi nces	ng a		_	
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Course Code	9				L	Т	Р	С
Course Nam	e	தமி	<u>і</u> р. I		3	0	0	3
Prerequisite	,				L	Т	Р	Н
C:P:A	3:0:0				3	0	0	3
		COURSE OUTCOMES		DOM	IAIN		LEVE	L
1		After the completion of th	ne course, students will be					
		டையாளம் காணுதல்) பல் தொண்டுகளைத் தமிழ்மெ		Cognit	ive	Re	memb	ber
கொள்								
		செய்தல்) பன்முகப் பரி லக்கியங்கள் மூலம் அர		Cognit	ive	Re	memb	ber
CO3 Descr		க்குதல்) தமிழ் மகளிரின்		Cognit	ive	Un	derst	and
CO4 Apply	(விளக்கு	தல்) பல்வேறு கலைத்து மகள் குறித்துத் தெளிவு		Cognit	ive	Ap	ply	
CO5 Analy	ze (பகுத்	தல்) சிறுகதைகளின் தே ள் - கவிதை குறித்துத்	ாற்றம் மற்றும் வளர்ச்சி	Cognit	ive	An	alyze	
		ளும் தமிழ்த்தொண்டும்		I		9		
	ட்சி்சுந்தர சிறப்புப் ெ	ம், கவிமணி தேசியவிநா	இலக்குவனார், உ.வே.சாட ாயகம் பிள்ளை தொடர்பா க்கவிகை)	ன் செய்த		சிறர்	ந்த	
			கண்ணதாசன், உ டும	-	-	ເລີ		
		கன, வாண்தாசன, சுரத ண சுந்தரம், மருதகாசி		ուր թույու	L16001 C	Б 0Ш,		
புதுக்கவிதை	் ந.பிச்ச(மு.மேத்தா, ஈரோடு தமிழ	⊋ன்பன், உ	புப்துல்	ரகு	மான்,	
<u>എ</u> ക്രെ-3		நாடல்கள், தமிழ் மகளிரில		9	9			
ஜி.யு.போப் ம அம்பேத்கர், அன்னி பெச	ற்றும் வீர காமராசர், ன்ட் அம்எ	மாமுனிவரின் தமிழ்ப்பணி மா.பொ.சிவஞானம், காய	, பெரியார், அண்ணா, மு பிதே மில்லத் சமுதாயத் மிர்தம்மாள், டாக்டர் முத்	தொண்டு.			Τ,	
ച്ച லகு-4	நாட்டுப்ப	றுப்பாடல்		9	9			
		றில் பாடல், ஒப்பாரிப் பா	டல்.					
ച്ചുഖദ്ര-5		ப வரலாறு		9	9			
	-	நாடகம், கவிதைகள்.						
LECTU	RE	TUTORIAL	PRACTICAL			<u>FAL</u>		
45					4	5		

பாட நூல்கள்:

- முனைவர் கா.செல்வகுமார் (தொ.ஆ.), பொதுத்தமிழ், மார்ச் 2022, துரைகோ பதிப்பகம், அரும்பாக்கம், சென்னை – 106. 9884159972.
- முனைவர் மு.அருணாசலம் (ப.ஆ.) தமிழ் இலக்கிய வரலாறு 2012, அருண் பதிப்பகம், தரைத்தளம், பாலாஜி நகர், ளுடிஜ காலனி, கண்டோன்மெண்ட், திருச்சி - 1. 9894440530
- சு.சக்திவேல் நாட்டுப்புற இயல் ஆய்வு, மணிவாசகர் பதிப்பகம் 12, மேலசன்னதி வீதி, சிதம்பரம் - 1.
- முனைவர் கோ.பெரியண்ணன் அடிப்படை எளிய தமிழ் இலக்கணம் 2003 வனிதா பதிப்பகம், 11- நானா தெரு, பாண்டி பஜார், தி.நகர், சென்னை - 17.

பார்வை நூல்கள்:

- 1. முனைவர் ந.லெனின், தாலாட்டுப் பாடல், பிப்ரவரி 2015, பிருந்தா பதிப்பகம், தஞ்சாவூர் 5.
- கோ. வெங்கடாசலம் (தொ.ஆ.) 2005, தமிழ் இலக்கிய கைவிளக்கு, அன்னை சரஸ்வதி பதிப்பகம், குடியாத்தம்.
- முனைவர் இராஜா வரதராஜா பயன்முறைத் தமிழ் ஜுன் 2015, சிவகுரு பதிப்பகம், 7∴40, கிழக்குச் செட்டித்தெரு, பரங்கிமலை, சென்னை – 16.

Table	1: /	Assessment	Temp	late
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S.No.	Task	Marks
1	CA 1 (Descriptive + MCQ)	15
2	CA 2 (Class Test- Descriptive + MCQ)	15
3	CA3 (Rubrics prepared by the Course Teacher)	20
4	CA 4- End Semester Pattern (MCQ – 20% + Descriptive 80%)	50
	Total	100

	Cours	e Name	Differential Calculus and Trigonometry	L	Т	Р	С
(Cours	se Code	XMT103	3	1	0	4
С	Р	Α		L	Т	SS	H
4	0	0		3	2	0	5
Prer	equisi	ite	Higher Secondary level Mathematics				
On sı	iccess	sful completion	on of this course, the students will be able to:				
			Course Outcomes	Dom	ain	Lev	el
CO 1		Apply Leib	nitz rule to solve problems related to nth order derivatives	Cogni	tive	Apply	ving
CO 2	2	Identify ma	ixima and minima of multivariable functions	Cogni	tive	Apply	ving
CO 3	3		concept and principles of differential calculus to find the radius of curvature, envelopes, evolute and involute of rves	Cognit	tive	Apply	ving
CO 4	ļ	Demonstra	te the expansions of trigonometric functions in terms of θ	Cogni	tive	Unders	
CO 5	5	Demonstra functions	te the relations between hyperbolic functions and circular	Cognit	tive	ing Unders ing	stan
UNI	Г 1	Successive	Differentiation			12	
Form	ation	of equations Partial Diff	tion – The n th derivative – Standard results – Trigonor involving derivatives – Leibnitz formula for the n th derivativ ferentiation, Maxima and minima of functions of two vari	e of a p	trans roduct	formati – Proof 12	
Succe Hom Maxi	ogene ma ai	eous function nd minima of	atives – Function of function rule – Total differential coeffic s – Partial derivatives of a function of two functions – Taylo functions of two variables – Lagrange's method of undeterm	or's exp	ansion	of <i>f(x</i> ers.	, y)
Hom Maxi UNI Enve coord	ogene ma ar F 3 lopes linate co-or	eous function nd minima of Envelopes, – Method o s of centre o	s – Partial derivatives of a function of two functions – Taylo functions of two variables – Lagrange's method of undeterm Curvature of Plane curve of finding envelope – Curvature – Cartesian formula for r f curvature – Evolute and involute – Radius of curvature v equation; pedal equation of a curve – Chord of curvature.	or's exp lined mu	ansion ultiplie of curv	$f(x) = \frac{12}{12}$, y) Th en i
Succe Home Maxi UNI Enve coord polar UNI Expa \cdots - E of θ -	ogene ma ar F 3 lopes linate co-or F 4 nsion Examj - Expa	eous function nd minima of Envelopes, – Method of s of centre of rdinates – p-r Expansions s of cos $n\theta$ a ples on formation	s – Partial derivatives of a function of two functions – Taylo functions of two variables – Lagrange's method of undeterm Curvature of Plane curve of finding envelope – Curvature – Cartesian formula for r f curvature – Evolute and involute – Radius of curvature v equation; pedal equation of a curve – Chord of curvature. s and sin $n\theta$ - Expansion of tan $n\theta$ in powers of tan θ - Expandion of equations – Expansions of $\cos^n \theta$ and $\sin^n \theta$ in term θ and sin θ in a series of ascending powers of θ .	or's exp lined mu radius o when the nsion o	ansion ultiplie of curv e curve f tan 2	$f(x) = \frac{1}{2}$, y) Th en : - C iiple
Succe Home Maxi UNI Enve coord polar UNI Expa $\dots - E$ of θ - UNI	ogene ma ar F 3 lopes linate co-or F 4 nsion Examj - Expa F 5	eous function nd minima of Envelopes, – Method of s of centre of rdinates – p-r Expansions s of cos $n\theta$ a ples on formation ansion of cos Hyperbolic	s – Partial derivatives of a function of two functions – Taylo functions of two variables – Lagrange's method of undeterm Curvature of Plane curve of finding envelope – Curvature – Cartesian formula for r f curvature – Evolute and involute – Radius of curvature v equation; pedal equation of a curve – Chord of curvature. s and sin $n\theta$ - Expansion of tan $n\theta$ in powers of tan θ - Expandion of equations – Expansions of $\cos^{n} \theta$ and $\sin^{n} \theta$ in term θ and sin θ in a series of ascending powers of θ . Functions and Logarithms of Complex quantities	or's exp ined m adius o when the nsion o s of fun	ansion ultiplie	$f(x) = \frac{1}{12}$ $f(x) = \frac{12}{12}$ $f(x) = \frac{12}{12}$ $f(x) = \frac{12}{12}$ $f(x) = \frac{12}{12}$, y) Th en : - C tiple
Succe Home Maxi UNIT Envel coord polar UNIT Expa \cdots - E of θ - UNIT Hype circul	ogene ma ar Γ 3 lopes linate co-or Γ 4 nsion Examj - Expa Γ 5 erbolic lar fu	eous function nd minima of Envelopes, – Method c s of centre o rdinates – p-r Expansions s of cos $n\theta$ a ples on forma ansion of cos Hyperbolic c functions – Inv	s – Partial derivatives of a function of two functions – Taylo functions of two variables – Lagrange's method of undeterm Curvature of Plane curve of finding envelope – Curvature – Cartesian formula for r f curvature – Evolute and involute – Radius of curvature w equation; pedal equation of a curve – Chord of curvature. Such as $n\theta$ - Expansion of tan $n\theta$ in powers of tan θ - Expandition of equations – Expansions of $\cos^{n} \theta$ and $\sin^{n} \theta$ in term θ and $\sin \theta$ in a series of ascending powers of θ . Functions and Logarithms of Complex quantities Relations between hyperbolic functions – Relations between verse hyperbolic functions – Separation into real and imagin	or's exp lined m radius o when the nsion o s of fun	ansion ultiplie f curve curve f tan A ictions	$f(x) = f(x)$ $f(x) = \frac{12}{12}$, y) Then : - C ciplo
Succe Home Maxi UNIT Enve coord polar UNIT Expa \cdots - F of θ - UNIT Hype circul comp	ogene ma ar Γ 3 lopes linate co-or Γ 4 nsion Examj - Expa Γ 5 erbolic lar fu	eous function nd minima of Envelopes, – Method of s of centre of rdinates – p-r Expansions s of cos $n\theta$ a ples on formation of cos Hyperbolic c functions – Invitions – Invitions – Invitions – Invitions – Invitions – Invitional descent of the second s	s – Partial derivatives of a function of two functions – Taylo functions of two variables – Lagrange's method of undeterm Curvature of Plane curve of finding envelope – Curvature – Cartesian formula for r f curvature – Evolute and involute – Radius of curvature w equation; pedal equation of a curve – Chord of curvature. of tan $n\theta$ - Expansion of tan $n\theta$ in powers of tan θ - Expandion of equations – Expansions of $\cos^n \theta$ and $\sin^n \theta$ in term θ and $\sin \theta$ in a series of ascending powers of θ . Functions and Logarithms of Complex quantities Relations between hyperbolic functions – Relations between	or's exp lined m radius o when the nsion o s of fun	ansion ultiplie f curve curve f tan A ictions	$f(x) = \frac{1}{2}$, y) Then : - C ciplo

- Calculus Volume I, S. Narayanan and T.K. ManicavachagomPillay, S. Viswanathanpvt. Ltd., 2014. Unit I : Chapter III (All sections) Unit II : Chapter VIII (Sections 1, 3, 4 & 5) Unit III: Chapter X (All sections)
- Trigonometry, Narayanan and T.K. ManicavachagomPillay, S. Viswanathanpvt. Ltd., 2014. Unit IV: Chapter III

Unit V: Chapter IV (All sections) & Chapter V (Section 5)

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- 1. https://math.Korea. Edu/math_en/calculus/syllabus. Do [Korea University]
- 2. https://explore course. Stanford. edu/search?q=MATH21 [Stanford University]

			COs	s VS POs					
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	3	1	1	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	3	2	3	1	1	1	1
CO 4	3	3	2	1	3	1	0	1	1
CO 5	3	3	2	1	3	1	0	1	1
TOTAL	15	15	13	8	15	5	3	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1
0 - No Relation, 1 – I	Low Relati	on, 2- Me	dium Rela	ation, 3- H	ligh Rela	tion			

 $1\text{-}5 \rightarrow 1, 6\text{-}10 \rightarrow 2, 11\text{-}15 \rightarrow 3$

Cour	rse Nar	ne	Analytical G Calculus	eometry 3-	D and Integral	L	Т	P	C
Cou	rse Co	de		XMT1()4	3	1	0	4
С	Р	Α				L	Т	SS	H
4	0	0				3	2	0	5
Prerequisi	te		Higher Secor	ndary level	Mathematics				
On success	ful con	pletion o	f this course, th	e students v	will be able to:				
			Course Outcon	nes		Do	main	Lev	el
CO 1			e given lines at tween the skew		lines and shorte	st Cog	nitive	Apply	ing
CO 2	Id				plane to a give	en Cog	nitive	Apply	ying
CO 3	Â			e to Integra	ate functions of	a Cog	nitive	Apply	ing
CO 4	-		1		nma functions ar	nd Cog	nitive	Apply	ving
CO 5	A	oply the	ties to evaluate concepts of mu lume of the reg	Itiple integ	ral for finding th	ne Cog	nitive	Apply	ing
UNIT 1	uiv		funite of the reg					12	2
Analytical UNIT 2	Geome	try 3-D –	The plane – Th	e straight li	ne – Coplanar lin	nes - ske	w lines	S.D.	
Sphere- Tar	ngent p	lane- inte	ersection of two	spheres – I	Equation of tange	nt plane	to a sp	here.	
UNIT 3								12	2
Properties of	of defir	ite integr	als - Reduction	formulae o	f the types:				
$\int x^{n} e^{ax} dx,$ UNIT 4	,∫ x ⁿ co	osax dx,∫	sin ⁿ x dx,∫cos	ⁿ x dx,∫sin	$m x \cos^n x dx$, $\int t$	an ⁿ x d	X	12	
				U	ce of $\Gamma(n) - Recuen beta and gamm$			of gam	ıma
UNIT 5					en oeta and gann	na runci	10115.	12	2
*	<u> </u>		•		ble integral - cha multiple integrals	•	rder of	integra	tion
Lectu	ire	45	Tutorial	15	Practical	0	Tot	al	60
					Practical				
Text Books	5								
		ical geom	etrv: TKMP	illai 2015	(for Unit I & II)				

- 2. Calculus Vol II : T.K. M. Pillai, 2015 (for Unit III, IV & V)
 - Unit I:Chapter 2 (Sec: 1 7), Chapter 3 (Sec: 1 8)Unit II:Chapter 4 (Sec: 1 8)Unit III:Chapter 1 (Sec: 11, 13.1 13.6)Unit IV:Chapter 7 (Sec: 2 5)

Unit V : Chapter 5 (Sec: 2 - 5.4)

References

- 1. Solid Geometry- M.L. Khanna (Jainath& Co Publishers, Meerut)
- 2. Mathematics for BSc Vol I and. II P. Kandasamy. Thilagarathy (S. Chand and Co-2004)

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- 1. https://sites.math.washington.edu/~m125/ [Washington University]
- 2. https://courses.maths.ox.ac.uk/node/28 [Oxford University]

-			COs v	s POs	·				
	PO	PO2	PO	PO	PO5	PO	PO7	PO	PO9
	1		3	4		6		8	
CO 1	3	3	3	2	3	1	1	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	2	1	3	1	0	1	1
CO 4	3	3	2	1	3	1	0	1	1
CO 5	3	3	3	2	3	1	1	1	1
TOTAL	15	15	13	8	15	5	3	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1
0 - No Relation, 1 – I	Low Re	elation, 2- Mo	edium	Relatio	on, 3- Hig	h Relat	ion		. <u> </u>
$1-5 \rightarrow 1, 6-10 \rightarrow 2, 11$	-15→	3							

Co	ourse]	Name	Physics –I	L	Т	P	С		
Co	ourse	Code	XPG105	3	1	0	4		
С	Р	Α		L	Т	SS	Н		
4	0	0		3	1	0	4		
Prer	equisi	ite	Basic knowledge of physics concepts.						
On s	success	ful com	pletion of this course, the students will be able to:						
			Course Outcomes	Don	nain	Level			
CO	1		fy the principles of elasticity, derive expression for a couple and determine rigidity modulus of a wire	0	itive	Reme Unde			
CO	2		ibe sound, propagation, perception analysis of ical wave and effect echoes in building.	Cogn	itive	Unde			
CO	3		basic concepts of specific heat capacity List the f thermodynamics.	Cogn	itive	Reme ar under	nd		
CO	4	Under applic	rstand Interference, diffraction and identify their ations.	Cogn	itive	Underst			
CO :		Discu	the general properties of atoms and nucleus, so the various models and A nalyze various ations of X–ray.	Cogn	itive	Rememb Understa analyze 12			
Dete meth	ermina nods fo	tion of For the det	ooke' law-Different moduli of elasticity - Twistin tigidity modulus by Static Torsion method –Bendin ermination of Young's modulus by non-uniform be	ng of t	eams-	-Experi	iment		
of bu	ductic uilding ho and	gs – Revo Echelor	acteristic of musical sound - Loudness – unit of lou erberation – Reverberation time- requirements for g			se - Ac es of bu			
cooli	ing –v nal co	leat – S erificatio	pecific Heat of a Liquid by Joule's Electrical M on - specific heat capacity of a liquid by cooling– (ty – Lee's disc method for bad conductors – Blac	Condu	ction:	Coeffic	cient o		
UNI	T 4	Optic	\$			1	2		
Fresi	nel's	and Fra	rmination of thickness of a thin wire by air wedg unhofer diffraction – Diffraction grating–Disper ermination of refractive index and dispersive power	sion-	Optica				

UNIT 5	Atomic and N	Nuclear pl	hysics						12
ionization p Nuclear Ph	ics – Electron - ootentials – Pho ysics: Nuclear s nergy – nuclear	toelectric ize –mass	effect – – charg	X – rays ge – Mas	: contint s defect	ious and – Bindir	characte	ristic–ap y – packi	plications
Lecture	45	Tutoria	ıl 15	5 Pi	ractical		0	Total	60
Text Books	5								
Ho 2. Al 3. Pr References 1. Con 2Ser Pub E-Reference 1. Bisw THI (NP 2. NPT	Text book of so ouse, 1985 Ilied physics – A operties of matta acepts of Moder othil Kumar C lishers, Chenna ces[MOOC, SV wanath Banerje EORY OF ELA TEL), https://n FEL, Engineer orkee.	A. Sundara ter – R. M n Physics, d., "Engir i, 2011. VAYAM, e and Am STICITY ptel.ac.in/	avelusar urugesa , <i>Arthur</i> neering NPTEI it Shaw ", Natio	ny, Priya n. S Ch <i>Beiser, C</i> Physics L, Webs , Depart onal Prog /105/105	a Publica and & C 6 th Ed, N ", 2nd ites etc. ment of gramme	ations, K Co. Pvt. L AcGraw Enlarge] Civil Er on Tech 5177/	arur-2. .td., New Hill (Ind ed Revis	Delhi. 2 ia) Pvt. L sed Edit g IIT Kh Enhanceo	td., 2009 ion, VR haragpur, d Learnin
KOC	$\mathbf{PO1}$	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	3	1	1	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	2	1	3	1	0	1	1
CO 4	3	3	3	3	3	1	2	1	1
CO 5	3	3	3	3	3	1	2	1	1
TOTAL	15	15	14	11	15	5	6	1	1
SCALED VALUE	3	3	3	3	3	1	2	1	1
0 - No Rela	tion, 1 – Low	Relation	2 Modi	Dal		TT' I D	-1-4		

0	1	- NT	-			DI		-41	т		1		1		l		
C	ours	e Nam	e			Pny	sics Pra		• 1			L	Т	Р	С		
C	Cours	se Cod	e				XPG1	106				0	0	4	2		
С	P		A									L	Т	Р	Н		
0.5	1		0.5														
0.5	T		J. 5									0	0	4	4		
Prere	equisi	ite		Basic	knowledge	of ph	ysics co	ncepts.									
On su	iccess	sful cor	npletic	on of th	is course, th	e stu	dents wi	ll be at	ole to:								
					Course Out	com	es]	Doma	in	Lev	vel		
CO 1		Descr wave.		ound,	propagation	, per	ception	analys	sis of ac	oustical		Cognit ychom		Know e	Ũ		
CO 2									Anal Mech m Resp	ianis 1							
CO 3				-	city, recall c heat capac		concep	ts of	temperatu	ire and		Cognit ychom		Eval			
CO 4		_			ce & diffrac nterference.	tion	and ana l	l ysis va	urious app	lication	Psy	chom	chomotor: Knowle e, Mecha				
CO 5		Know partic		determ	ination of	wave	elength	and siz	ze of the	e micro		Cognit ychom		r Comp nsic Evalu	orehe on,		
Ex. l	No	Expe	riment	s (Any	Eight Exp	erim	ents)										
1.					n – Determi			rigidity	modulus	of thin v	vire.			CC	02		
2.					- Non unifor		•			pe.				CC			
3.	,				c heat capac									CC			
4.		-		-	ity of liquid			aw of o	cooling					CC			
5.		-			fractive inde		-							CC			
6.		-		-	ng – a wavel	_	n of vario	ous spe	ctral line	by norma	al in	cidenc	e	CC			
7.	•	Air w	edge –	Thick	ness of wire									CC)4		
8.		Sonor	neter –	- verifi	cation of law	VS								CC)1		
9. 10			grating		cific heat cap termination		•	•			the r	nicro		CC CC			
L	ectur	-		0	Tutoria	ы	0	P	ractical		30		Tot	പ	30		

Course Name	Classical Algebra	L	Т	Р	C	
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1. C. L. Arora, "B.Sc. Practical Physics", S. Chand & Company Ltd. Ram Nagar, New Delhi, 2007.

2. R. K. Shukla & Anchal Srivastava. "Practical Physics," New Age International (P) Ltd, Publishers, New Delhi, 2006.

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- 2. C. Ouseph,K. Rangarajan, "A Text Book of Practical Physics", Volume I & II, S.Viswanathan Publishers,1997.

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- 1. Amal Kumar Das, Department of Physics, IIT Kharagpur, "Experimental Physics II", National Programme on Technology Enhanced Learning (NPTEL), <u>https://nptel.ac.in/courses/115/105/115105120/</u>
- 2. S. Srinivasan, Department of Electrical Engineering, IIT Madras, "Digital Circuits and Systems", National Programme on Technology Enhanced Learning (NPTEL), <u>https://nptel.ac.in/courses/117/106/117106086/</u>

			C	Os vs POs					
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	1	2	1	1
CO 2	3	3	3	3	3	1	2	1	1
CO 3	3	3	3	3	3	1	3	1	1
CO 4	3	3	3	3	3	1	2	1	1
CO 5	3	3	3	3	3	1	3	1	1
TOTAL	15	15	15	15	15	5	12	5	5
SCALED VALUE	3	3	3	3	3	1	3	1	1

0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation 1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3

	ourse	Code			XMT	203		3	1		0	4		
С	Р	Α						L	Т		SS	Н		
4	0	0						3	1		0	4		
Prer	equisi	te	Basic	knowledge o	of Polyn	omials, logar	ithmic fun	ctions.						
On s	uccess	ful comp		of this course C ourse Outco		idents will be	able to:	Dom	ain		Le	vel		
CO 1	1			y Hamilton 7 ven matrix	Theorem	n to find inv	verse and	Cogni	itive	A	pplyi	ng		
CO		Utilize a giver	Newt Nolyr	on's method t omial equation	on			Cogni			pplyi	-		
CO 3	3		um nu	artes' rule of mber of posit	0	1		Cogni	itive	A	pplyi	ng		
CO 4		Utilize to iden	the bi tify ter	nomial theore	n polyn	omial		Cogn			pplyi	-		
CO S	5		0	withmic fund		to solve e	equations	Cogni	itive	A	Applying			
					nons						12			
		MATH										2		
Char equa orthc	acteris tion of ogonal	tic roots transfor matrices	and cl matior		ectors - milton						stic			
equa orthc UNI Relat	acteris tion of ogonal T 2 tion b	tic roots transfor matrices THEO etween	and cl matior DRY O roots	naracteristic v n – Cayley-Ha	ectors - imilton DNS nts- syi	theorem – Di nmetric func	agonalisat	ion of a he roo	a mat ots in	rix te	stic – 1 erms	2 of the		
Char equa orthc UNI Relat coeff	racteris tion of ogonal T 2 tion b ficients	tic roots transfor matrices THEC etween m s- imagir	and ch matior A PRY O roots a ary ro	naracteristic ve n – Cayley-Ha F EQUATIC and coefficien	ectors - imilton DNS nts- syi nal root	theorem – Di nmetric func ts- sum of the	agonalisat	ion of a he roo	a mat ots in	rix te	stic - 1 erms 1 equa	2 of the		
Char equa orthc UNI Relat coeff UNI Tran	acteris tion of ogonal T 2 tion b ficients T 3 sforma	tic roots transfor matrices THEO etween s- imagir TRAN ation of e	and ch matior a DRY O roots a hary ro [SFOR equatio	naracteristic ve	ectors - imilton DNS nts- syn nal root F EQU cal equa	theorem – Di mmetric func <u>as- sum of the</u> ATIONS tions- standar	agonalisat etions of t powers of rd forms to	tion of a the root f the root increa	a mat ots in ots of	rix te f an d d	stic - erms 1 equa 1 ecrea	2 of the ation. 2		
Char equa orthc UNI Relat coeff UNI Tran	racteris tion of ogonal T 2 tion b ficients T 3 sforma	tic roots transfor matrices THEO etween s- imagin TRAN ation of e iven equ	and cl matior DRY O roots a ary ro (SFOF equation ation b	naracteristic v n – Cayley-Ha F EQUATIC and coefficien ots and irratio RMATION O ns – Reciproc	ectors - umilton DNS nts- syn nal root F EQU cal equa untity- F	theorem – Di mmetric func <u>as- sum of the</u> ATIONS tions- standar	agonalisat etions of t powers of rd forms to	tion of a the root f the root increa	a mat ots in ots of	rix te f an d d	stic - erms 1 equa 1 ecrea gn.	2 of th ation. 2		
Char equa orthc UNI' Relat coeff UNI' Tran roots UNI' Bino – Bi	racteris tion of pgonal T 2 tion be ficients T 3 sforma of a g T 4 mial the nomia ericall	tic roots transfor matrices THEC etween f s- imagin TRAN ation of e iven equ BINO heorem – 1 theore y greates	and cl matior PRY O roots a ary ro SFOF equation ation to MIAL - positi m for st term	naracteristic vo – Cayley-Ha F EQUATIC and coefficient ots and irration RMATION O ons – Reciproco by a given qua	ectors - umilton DNS nts- syn nal root F EQU cal equa antity- F dex – th ndex – n of a se	theorem – Di mmetric func is- sum of the ATIONS tions- standar Removal of te ne greatest co particular ca eries	agonalisat etions of t powers of rd forms to rms- Desc efficient in ases of th	ion of a the roo f the ro increa artes' r	a mat ots in ots of use an ule o	rix te f an d d f si	stic - erms a equa a equa gn. 1 a of (spans	2 of th ation. 2 $2 ase the 2$ $1 + x)$		
Char equa ortho UNI' Relat coeff UNI' Tran roots UNI' Bino – Bi Num UNI' Expo	acteris tion of ogonal T 2 tion b ficients T 3 sforma of a g T 4 mial th nomia tericall T 5 onentia	tic roots transfor matrices THEO etween transfor etween transfor TRAN ation of e iven equi BINO neorem – 1 theore y greates EXPO I limit –	and ch mation PRY O roots a nary ro SFOR equation ation h MIAL - positi m for st term NENT the ex	naracteristic v a – Cayley-Ha F EQUATIC and coefficien ots and irratio RMATION O ns – Reciproc by a given qua THEOREM ive integral in a rational ir s – summation	ectors - umilton DNS nts- syn nal root F EQU cal equa untity- F dex – th ndex – n of a se OGAR	theorem – Di mmetric func ts- sum of the ATIONS tions- standar Removal of te ne greatest co particular ca eries ITHMIC SE	agonalisat etions of t powers of rd forms to rms- Desc refficient in ases of th RIES	the roo f the roo o increa artes' r n the ex e Bino	a mat ots in ots of use an ule o xpans omial	rix tef an d d f si sion ex	stic - 1 erms 1 ecrea gn. 1 n of (spans 1	$2 \\ of the function function for the function for $		

1. Engineering Mathematics, Vol.I. P.Kandasamy, K.Thilagavathi, K.Gunavathi, S.Chand& sons, second edition,1996

Unit – I: Matrices: Chapter 5

2. Algebra Volume I, T.K.M. Pillay, T. Natarajan and K.S.Ganapathy, S. Viswanathan (Printers & Publishers) Pvt. Ltd., 2015.

Unit II	:	Chapter 6 (Sections 1 - 13)
Unit III	:	Chapter 6 (Sections 15 – 19, 24)
Unit IV	:	Chapter 3 (Sections 1, 5, 6, 8, 10)
Unit V	:	Chapter 4 (Sections 1, 2, 3, 5, 6, 9)

References

- 1. S. Arumugam and A. ThangapandiIssac, Theory of equations and Trigonometry, New Gamma Publishing House, Palayamkottai, 2011.
- 2. A. Singaravelu, Engineering Maths Volume I, Meenakshi Agency 2019 Edition

E-References

- 1. https://explore course. Stanford. edu/search?q=MATH51[Stanford University]
- 2. https://courses.maths.ox.ac.uk/node/37616[Oxford University]

			С	Os vs PO	Ds							
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9			
CO 1	3	3	3	2	3	1	1	1	1			
CO 2	3	3	3	2	3	1	1	1	1			
CO 3	3	3	3	2	3	1	1	1	1			
CO 4	3	3	3	2	3	1	1	1	1			
CO 5	3	3	3	2	3	1	1	1	1			
TOTAL	15	15	15	10	15	5	5	5	5			
SCALED VALUE	3	3	3	2	3	1	1	1	1			
0 - No Relation, 1	l – Low l	Relation	, 2- Med	ium Rel	ation, 3	- High R	elation					
$1-5 \rightarrow 1, 6-10 \rightarrow 2$	$1.5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$											

Course Name			Sequence and Series XMT204					L	Т	P	С		
Course Code							3	1	0	4			
С	Р	Α						L	Т	SS	Н		
4	0	0						3	1	0	4		
Prer	equis	ite	Basic	knowledge of	of numbers								
On s	succes	sful com	pletion	of this cours	e, the stude	ents will be able	e to:						
			Course Outcomes D				Domain		Level				
				f an infin oscillating	ite sequer	nce is bound	ded,	Cogni	tive	Evaluating			
CO 2 De		Determ	ine th	e		is convergent s.	or	Cogni	tive	Understanding			
CO \sim		diverge	nt by us	sing the appr	opriate test	is convergent s. for a given infi		Cogni		Evaluating Applying			
		series											
CO	5			the conce	1	the Weirst	rass	Cogni	tive	Unders	tandin		
UNI	inequalities and Cauchy's inequality NIT 1							12					
	-			ate: Upper an a limit, finite		ounds – Bounde	ed seq	uence	s - mo	notonic			
UNIT 2		aways to		<i></i>						12			
		aral theor	oma ac	ncerning inf	inite series	– series of posi			comr				
Cauc	chy's o	condensa	tion tes	st – D-Alemł	pert's ratio	test - Definition	n of co	onverg	gence,	Diverg	ence		
Cauc and (chy's o Oscilla es.	condensa	tion tes	st – D-Alemł	pert's ratio	test - Definition	n of co	onverg	gence,	Diverge Geome	ence		
Cauc and Cauc Serie UNI Cauc	chy's o Oscilla es. T 3 chy's 1	condensa ation- Ne root test a	tion test ecessary	st – D-Alemb y condition for ir simple pro	oert's ratio f or converge oblems - Ra	test - Definition	n of co	onvergent $\sum \frac{1}{n}$	gence, $\frac{1}{p}$ and	Diverge Geome	ence etric 2		
Cauc and Cauc Serie UNI Cauc	chy's o Oscilla es. T 3 chy's i rnativo	condensa ation- Ne root test a	tion test ecessary	st – D-Alemb y condition f	oert's ratio f or converge oblems - Ra	test - Definition ence- converge	n of co	onvergent $\sum \frac{1}{n}$	gence, $\frac{1}{p}$ and	Diverg Geome 1 nt serie	ence etric 2		
Cauc and C serie UNI Cauc Alter UNI Sum	chy's o Oscilla cs. T 3 chy's 1 rnativo T 4 matio	condensa ation- Ne root test a e series v	tion test ecessary and the vith sim	st – D-Alemb y condition f ir simple pro pple problem	oert's ratio for converge oblems - Ra	test - Definition ence- converge	n of co nce of osolute	Sonvergent for $\sum \frac{1}{n}$	gence, $\frac{1}{p}$ and	Diverg Geome 1 nt serie 1	ence etric 2 s - 2		
Cauc and C serie UNI Cauc Alter UNI Sum UNI	chy's o Oscilla T 3 Chy's 1 rnativo T 4 matio T 5	condensa ation- Ne coot test a e series v n of serie	tion tes ecessary and the vith sim	st – D-Alemb y condition f ir simple pro ple problem nmation by o	oert's ratio for converge oblems - Ra is. different set	test - Definition ence- converges abe's test – Ab ries – recurrin	n of co nce of osolute	onvergef $\sum \frac{1}{n}$	gence, $\frac{1}{p}$ and werge	Diverg Geome 1 nt serie 1 1	ence etric 2 s - 2 2		
Cauc and C serie UNI Cauc Alter UNI Sum UNI	chy's o Oscilla T 3 Chy's 1 rnativo T 4 matio T 5	condensa ation- Ne root test a e series v n of serie	tion tes ecessary and the vith sim	st – D-Alemb y condition f ir simple pro ple problem nmation by o	oert's ratio or converge oblems - Ra is. different ser c means- W	test - Definition ence- converges abe's test – Ab	n of co nce of osolute	onvergef $\sum \frac{1}{n}$	gence, $\frac{1}{p}$ and werge	Diverge Geome 1 nt serie 1 1 nequali	ence etric 2 s - 2 2		

(Printers & Publishers) Pvt. Ltd., 2015.

- Unit I :Chapter 2 (Sec: 4 7), Pages: 20 40
- Unit II :Chapter 2 (Sec: 8 16), Pages: 41 68
- Unit III:Chapter 2 (Sec: 17 19, 21 24), Pages: 68 88
- Unit IV:Chapter 5 (Sec: 1 7), Pages: 246 281
- Algebra Volume II, T.K.M. Pillay, T. Natarajan and K.S.Ganapathy, S. Viswanathan (Printers & Publishers) Pvt. Ltd., 2015. Unit V :Chapter 4 (Sec: 1 – 12), Pages: 179 - 212

Reference

1. Sequence and series: S. Arumugam and Isaac, New Gamma Publishing House – 2002 Edition

E-References

- 1. https://courses.maths.ox.ac.uk/node/43846[Oxford University]
- 2. https://explore course. Stanford. edu/search?q=MATH21[Stanford University]

COs vs POs									
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	1	2	1	1
CO 2	3	3	2	1	3	1	0	1	1
CO 3	3	3	3	3	3	1	2	1	1
CO 4	3	3	3	2	3	1	1	1	1
CO 5	3	3	2	1	3	1	0	1	1
TOTAL	15	15	13	11	15	5	5	5	5
SCALED VALUE	3	3	3	3	3	1	1	1	1
0 - No Relation, 1	0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation								
$1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$									

Course Name Course Code		Name	Physics –II	L	Т	Р	C 4	
		Code	XPG205	3	1	0		
С	Р	Α		L	Т	SS	Н	
2.8	0.8	0.4		3	1	0	4	
Prer	equisi	te	Basic knowledge of Physics.					
On s	success	ful com	bletion of this course, the students will be able to:					
			Course Outcomes	se Outcomes Doma				
CO 2 and ap potent throug			Ohms law, learn about resistors and capacitors ply knowledge to calibrate low voltmeter using iometer. Biot–Savart's law, explain current passing h straight conductor, coil and distinguish various ties of magnetic materials.	Cogn Cogn		Understand Remember, understand, analyze		
			basic of semiconductor distinguish different of diodes and their applications.	Cogn	itive	Understand apply		
CO	4	Exam conver discus	itive	Understand Apply				
CO	1110							
UNI			TRICITY f resistance in series in parallel – Specific resistance				+3	
in se meas Elec	eries a sureme	nd para nt of spo netic in	 llel – Kirchhoff's laws – Wheatstone's Bridge – ecific resistance - Potentiometer – Principle – Calib nduction: Laws of electromagnetic induction – 	- Care	y Fost of volti	er's bi neter.	idge	
UNI	TI	MAG	NETISM			9-	+3	
inter para	nsity, n and fe	nagnetic	 Ampere's circuital law – Magnetic properties induction, permeability, magnetic susceptibility – gnetic materials. – Magnetic field due to current - coil. 	- brief	introdu	uction	of dia	
UNIT III SEMICONDUCTOR						9+3		
Char	racteris	tics- fu	niconductors – Types of semiconductors– Pl ll wave and Bridge rectifiers – Zener diode– chara age regulator– Photo Diode and Uses.	•				
	TIV		BER SYSTEM AND LOGIC GATES			9-		

Number System: Decimal – Binary – Octal – Hexadecimal Number Systems – Binary Arithmetic Operations – Addition – Subtraction – Multiplication – Division – 1's Complement – 2's Complement Binary Operation.

Logic Gates: Basic Logic Gates AND, OR, NOT, NAND, NOR, XOR, X – NOR – Universal Building Blocks.

UNIT VBOOLEAN ALGEBRA AND KARNAUGH MAPS9+3Basic law of Boolean algebra – Demorgan's theorems – Duality Theorem – Reducing BooleanexpressionsUsing Boolean laws – Minterms – Maxterms – Sum of Products – Products of Sums.3 Variable K – Map – 4 - Variable K – Map sum of product only –Simplification of K-Maps.9+3

Lecture	45	Tutorial	15	Practical	0	Total	60
					·		

Text Books

- 1. R Murugeshan, "Modern Physics", 3rd Edition, S. Chand Publishing, New Delhi, 2004.
- 2. Electricity and Magnetism, R. Murugesan, Revised Edition, S. Chand & Co., New Delhi, Reprint (2014)
- 3. M. Morris Mano and Michael D. Ciletti, —Digital Designl, 5th Edition, Pearson, 2014.

4. Albert Paul Malvino; Donald P Leach; GoutamSaha, "Digital principles and applications", 8th Edition, McGraw Hill Education, New Delhi, 2015.

References

1. Thomas L. Floyd, —Digital Fundamentals, 10th Edition, Pearson Education Inc, 2011.

2. Jacob Millman, Christos Halkias, "Analog and Digital Circuit and Systems", 2nd Edition, Tata McGraw–Hill Education, 2017.

- Biswanath Banerjee and Amit Shaw, Department of Civil Engineering IIT Kharagpur, "THEORY OF ELASTICITY", National Programme on Technology Enhanced Learning (NPTEL), <u>https://nptel.ac.in/courses/105/105/105105177/</u>
- Prof. GoutamSaha, Department of Electronics & Communication Engineering IIT Kharagpur, "DIGITAL ELECTRONIC CIRCUITS", National Programme on Technology Enhanced Learning (NPTEL), https://nptel.ac.in/courses/108/101/108101091/
- 3. Prof. S. Srinivasan Department of Electrical Engineering, IIT Madras, "Digital Circuits and Systems", National Programme on Technology Enhanced Learning (NPTEL), https://nptel.ac.in/courses/117/106/117106086/

	COs vs POs											
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9			
CO 1	3	3	2	1	3	1	0	1	1			
CO 2	3	3	3	3	3	1	2	1	1			
CO 3	3	3	3	2	3	1	1	1	1			
CO 4	3	3	3	2	3	1	1	1	1			
CO 5	3	3	3	2	3	1	1	1	1			
TOTAL	15	15	14	10	15	5	5	5	5			

SCALED VALUE	3	3	3	2	3	1	1	1	1
0 - No Relation, 1	-Low	Relation,	2- Medi	um Rela	ation, 3 [,]	- High R	elation		
$1-5 \rightarrow 1, 6-10 \rightarrow 2$	2, 11-15 -	→3							

	Na	Course me		Phys	ics Pra	ctical - II		L	T]	P	С	
Co	ourse	e Code			XPG	206		0	0		4	2	
С	Р	Α						L	Т]	P	Н	
0.5	1	0.5						0	0		4	4	
Prer	requ	isite	Basi	c knowledge	of Phy	sics.							
On s	succe	essful co	ompletio	n of this cour	se, the	students will be	e able	to:					
			C	ourse Outcon	nes			Dom	ain		Le	evel	
CO	01	Explai calibra	-	cific resista oltmeter usin	notor tive	Μ	alyze, nanism pond						
CO	02	Measu maxim		different physical parameters with Cognitive Psychomotor							Evaluate		
CO)3		Magne h coil, so		explair	current pass	sing	Psychon Affec			Analyze, Mechanism		
CO)4	Const	ruct sim	ple circuits us	sing log	gic gates.		Cogni Psychor		S	thesis		
CO)5		the concircuits.	ceptual differ	rence b	etween analog	and	Cogni Psychor		Con	ehension		
Ex.	No	Exper	iments (Any Eight E	xperin	nents)							
1.	•	Potent	iometer -	- low range v	oltmete	er					С	01	
2.	•	Carey	Foster's	Bridge – Spe	cific R	esistance Deter	minat	ion			С	O1	
3.	•			gnetometer –								03	
4.	•	Field a	long the	axis of the co	oil						С	03	
5.	•	P.O B	ox – Spe	cific Resistan	ce						С	01	
6.	•	Logic	gates (A	ND, OR, NO	T) – us	ing discrete cor	npone	ents			С	05	
7.		NANE	& NOF	as Universa	l Logic	gates.					С	05	
8.	•	Basic 1	Logic ga	tes IC's verif	ication						С	O2	
9.	,	Verific	ation of	De Morgan's	theore	em.				CO4			
10).	Half a	lder & H	lalf subtractor	r using	basic gate.					С	O4	
Le	ectur	·e	0	Tutorial	0	Practical		30	Tot	al		30	

Text Books

- 1. C. L. Arora, "B.Sc. Practical Physics", S. Chand & Company Ltd. Ram Nagar, New Delhi, 2007.
- 2. R. K. Shukla & Anchal Srivastava. "Practical Physics," New Age International (P) Ltd, Publishers, New Delhi, 2006.

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- 1. Indu Prakash and Ramakrishna, "A Text Book of Practical Physics," 11th Edition, KitabMahal, New Delhi, 2011.
- 2. C. Ouseph,K. Rangarajan, "A Text Book of Practical Physics", Volume I & II, S.Viswanathan Publishers,1997.

$\mathbf{E}-\mathbf{References}$

- Amal Kumar Das, Department of Physics, IIT Kharagpur ,"Experimental Physics II", National Programme on Technology Enhanced Learning (NPTEL), <u>https://nptel.ac.in/courses/115/105/115105120/</u>
- 2. S. Srinivasan, Department of Electrical Engineering, IIT Madras, "Digital Circuits and Systems", National Programme on Technology Enhanced Learning (NPTEL), https://nptel.ac.in/courses/117/106/117106086/

				CO	s vs PO	S			
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	1	2	1	1
CO 2	3	3	3	3	3	1	3	1	1
CO 3	3	3	3	3	3	1	2	1	1
CO 4	3	3	3	3	3	1	3	1	1
CO 5	3	3	3	3	3	1	3	1	1
TOTAL	15	15	15	15	15	5	13	5	5
SCALED VALUE	3	3	3	3	3	1	3	1	1
0 - No Relation,	1 - Low	Relatio	n, 2- M	edium F	Relation	, 3- Hig	h Relatio	n	
$1\text{-}5 \rightarrow 1, 6\text{-}10 \rightarrow$	2, 11-15	$\rightarrow 3$							

Course Name	Quantitative Aptitude I	L	Т	Р	С
Course Code	XMT207	2	0	0	2

С	Р	Α						L	T	Р	Н
2	0	0						2	0	0	2
Prer	equis	ite	Basic	mathematica	ıl know	ledge.					
On s	ucces	sful com	pletion	of this course	e, the st	udents will be	e able to:				
			C	Course Outco	omes			Don	nain	L	evel
CO1		_		asic concepts and to solve the		bers, H.C.F. o ms	&L.C.M	Cogn	itive	Under	standing
CO2		_		asic concepts and to solve		mal Fractions	5,	Cogn	itive	Under	standing
CO3	5	-		asic concepts e and to solve	-	are Roots & C oblems	ube	Cogn	itive	Under	standing
CO4	ļ	-		asic concepts ages and to so		lems on Num problems	bers,	Cogn	itive	Under	standing
CO5	;	-		asic concepts I to solvethe				Cogn	itive	Under	standing
UNI	T 1									6	
Num UNI		H.C.F. &	L.C.M	I of Numbers						6	
Deci	mal F	ractions,	Simpli	ification					I		
UNI	Т3									6	
Squa UNI		ots & Cu	ibe Roo	ots, Average.						6	
Prob	lems	on Numb	ers, Pr	oblems on Ag	ges.				I		
UNI	Т5									6	
Surd	s & Iı	ndices, Po	ercenta	ge.							
Le	ecture		30	Tutorial	0	Practical	0		Tota	al	30
Text	Bool	κ.								1	
1		S. Aggarv ition (201		antitative Ap	otitude	for Competitiv	ve Exami	nations	s, S Ch	and; 2	D th
	rence		0404 -	a hy Carrie	Val	Dort or 10		tor D	hara T		
1		0		s by Sangram Ltd.; Second e		i Rout and So (2014).	oumyaKar	ijanBe	nera, I	5.K.	
r						harma and An	shuman	Arihar	nt Publ	ication	
2		JC-COIN	TAT: T/Y	\mathcal{D}	uwall S	narma anu All	isiiuillall,	rundi	11 1 401	ication	•

3. Fast Track Objective Arithmetic by Rajesh Verma, ArihantPublication, Edition 2012.

E-References

- 1. www.careerbless.com
- 2. www.jagranjosh.com
- 3. www.bestguru.com

COs vs POs											
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9		
CO 1	3	3	2	1	3	1	0	1	1		
CO 2	3	3	2	1	3	1	0	1	1		
CO 3	3	3	2	1	3	1	0	1	1		
CO 4	3	3	2	1	3	1	0	1	1		
CO 5	3	3	2	1	3	1	0	1	1		
TOTAL	15	15	10	5	15	1	0	5	5		
SCALED											
VALUE	3	3	2	1	3	1	0	1	1		

 $1\text{-}5 \rightarrow 1, 6\text{-}10 \rightarrow 2, 11\text{-}15 \rightarrow 3$

SEMESTER III

(Course	Name	Differential Equations and Laplace Transforms	L	Т	Р	С
	Course	e Code	XMT301	3	1	0	4
С	Р	Α		L	Т	Р	Н
4	0	0		3	2	0	5
Pre	erequis	site	Knowledge of Ordinary and Partial Derivatives	ļ		Ι	
On	succes	sful comp	letion of this course, the students will be able to:				
			Course Outcomes	Dom	ain	Lev	vel
CC)1		the solution of a given partial differential equation which is rm of Clairaut's.	Cogni	tive	Applyi	ng
CC	02		trate the methods for finding particular integral of the ifferential equation	Cogni	tive	Unders ng	tandi
CC CC		partial d	he concepts of variation of parameters for solving a given ifferential equations given partial differential equation using Lagrange's Method	Cogni Cogni		Applyi Applyi	
CC)5	Solve se	cond order differential equations using Laplace Transforms	Cogni	tive	Applyi	ng
UN	NIT 1					9+	3
For	rmation	of differe	ntial equation – equation of the first order and the first degree	e - exact	differ	rential	
equ	ation -	- rules for	finding integrating factors – Equation of first order, but of hig	gher deg	ree - (Clairaut	's
for	m.						
UN	NIT 2					9+	3
Lin	near dif	ferential e	quations with constant coefficients: Particular Integral – meth	ods for	findin	g P.I	linea
equ	ations	with varia	ble coefficients.				
UN	NIT 3					9+	3
Va	riation	of parame	ters- Total differential equation Pdx+Qdy+Rdz=0- rules for i	ntegrati	ng		
Pdz	x + Qdy	y + Rdz =	0				
UN	NIT 4					9+	3
Par	tial Dif	ferential H	Equation- Four standard types- Lagrange's method for solving	g Pq + Q	Qq = R	-	
UN	NIT 5					9+	3
Laj	place tr	ansform –	Laplace transform of periodic functions - Some general theo	rems - l	nverse	e transfo	orms

- Solving second order differential equations using Laplace transform - problems

Lecture	45	Tutorial	15	Practical	0	Total	60
Text Book							

1.Calculus, volume III,S. Narayanan, T.K.M. Pillai, S. Viswanathan Pvt. Ltd., 2014.

Unit I : Chapter 1 (sec: 1 - 6), Pages: 1 - 38

Unit II : Chapter 2 (sec: 1 – 4, 8), Pages: 49 – 75, 81–89

Unit III: Chapter 2 (sec: 10), Chapter3(sec:7), Pages:91-95,108-114

Unit IV: Chapter 4 (sec: 1 - 6), Pages: 115 - 145

Unit V : Chapter 5 (sec: 1 – 8), Pages: 154 – 189

References

1. Engineering Mathematics- A. Singaravelu, Meenakshi Agency, 2022.

 Ordinary and Partial Differential Equations- M.D. Raisinghania and R.S. Aggarwal. S.Chand& Company Ltd, New Delhi, 2022.

COs vs POs												
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9			
CO 1	3	3	3	2	3	1	1	1	1			
CO 2	3	3	2	1	3	1	0	1	1			
CO 3	3	3	3	2	3	1	1	1	1			
CO 4	3	3	3	2	3	1	1	1	1			
CO 5	3	3	3	2	3	1	1	1	1			
TOTAL	15	15	14	9	15	5	4	5	5			
SCALED VALUE	3	3	3	2	3	1	1	1	1			
						l • • •	1	1 1				

0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation

 $1\text{-}5 \rightarrow 1, 6\text{-}10 \rightarrow 2, 11\text{-}15 \rightarrow 3$

Co	ourse l	Name	Vec	tor Calculus	, Fourie	er Series and Fo	urier	L	Т	P	C	
					Transfo	orms						
С	ourse	Code			XMT:	802		3	1	0	4	
С	Р	Α						L	Т	Р	Н	
4	0	0						3	2	0	5	
Prer	equisi	te	Knov	vledge In Diff	ferentiat	ion, Integration		1		Ι		
On s	success	ful comp	letion	of this course	, the stu	dents will be abl	e to:					
			(Course Outco	omes			Don	nain	L	evel	
CO1	l	Identif	y					Cogr	itive	Apply	ying	
CO2	2	Identif	y					Cogr	nitive	Appl	ying	
CO3	Identify Cognitive										ying	
CO4	CO4 Identity Cognitive									Applying		
CO5	5	Identif	y					Cogn	itive	Applying		
UNI	T 1	VECT	OR D	IFFERENTI	ATION		ļ			9	+3	
Diffe UNI		1		– Gradient, D TEGRATIC	0	e and Curl.				9	9+3	
Integ	gration	as invers	se of di	ifferentiation	– The li	ne integral – Sur	face into	egral -	– Gau	ss's		
Dive	ergence	theorem	, Gree	n's theorem,	Stoke's	theorem (Withou	ut Proof).				
UNI	T 3	FOUR	IER S	ERIES						9	9+3	
					richlet's	Conditions – Ev	ven and	odd fu	unctio	ns- Hal	f range	
sine UNI		1	0	sine series. ERIES						9	9+3	
Char	nge of i	interval -	- Parse	val's Theorer	n, Harm	onic Analysis.				Į.		
UNI	T 5	FOUR	IER T	RANSFORM	AS					9	+3	
Defi	nition	– Integr	al Tra	nsforms – Pr	operties	of Fourier Tra	insform	s – P	arseva	ıl's ide	entity -	
Infin	ite Fou	ırier cosi	ne and	sine transfor	m.							
Le	ecture	4	45	Tutorial	15	Practical	0		Tot	al	60	
Text	t Book	I		I	I	I I		I		I		
	Kanda Fouriei	•	I K. Tł	nilagavathy, N	/lathema	tics Volume IV:	Vector	Calcu	ılus, F	ourier	series	

Transforms, S. Chand&CompanyLtd, New Delhi, 2004.

- Unit I : Vector Calculus: Pages 1 23.
- Unit II: Vector Calculus: Pages 24 50
- Unit III: Fourier series: Pages 93 144
- Unit IV: Fourier series: Pages 145 174, 176 182
- Unit V : Fourier Transforms: Pages 196 226

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- 2. https://courses.maths.ox.ac.uk/node/43955 [Oxford University]
- 3. https://www.maths.cam.ac.uk/undergrad/files/coursesIA.pdf [Cambridge]

			C	Os vs PC)s				
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	3	1	1	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	3	2	3	1	1	1	1
CO 4	3	3	3	2	3	1	1	1	1
CO 5	3	3	3	2	3	1	1	1	1
TOTAL	15	15	15	10	15	5	5	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1
0 - No Relation,	1 – Low F	Relation,	2- Medi	um Rela	tion, 3-	High R	elation		
$1-5 \rightarrow 1, 6-10 \rightarrow$	2, 11-15 –	→ 3							

COs vs POs

C	Course	Name		Mathe	ematical S	Statistics- I		L	Т	Р	C
(Course	e Code			XMT3	03		3	1	0	4
С	Р	Α						L	Т	P	Н
4	0	0						3	2	0	5
Prer	equisi	te	Basic l	knowledge of sta	atistics.			1		I	ļ
On s	uccess	ful complet	tion of the	his course, the s	tudents w	ll be able to:					
				Course Outco	omes			Dom	ain	Le	vel
COI		Explain th	e conce	pts of discrete a	nd contin	ous random varia	ble	Cogni	tive	Unde ding	erstan
CO2		Explain th	e conce	pts of two-dime	ensional ra	ndom variable		Cogni	tive	Unde ding	erstan
CO3	5			generating fund n random variab		finding expectati	on and	Cogni	tive	Appl	ying
CO4	ļ	Explain that and Expon		-	distribut	ons, Gamma dist	ribution	Cogni	tive	Unde ding	erstan
CO5	;		orrelatio	on coefficient of	the given	random variables	by way	Cogni	tive	Appl	ying
UNI	T 1									9-	+3
	ibutior tion.					m variable – proba pability density fui	•			tributi	
Marg	ginal E	Distribution	Functio	5 1	ndepender	ss function – conti ace -Mathematical only.	-		•		
UNI	Т3									9-	+3
MGI	Fonly.		Characte	eristic Functions	s - Binomi	al, Poisson distrib	utions – N	/Ioment	ts, moo		
UNI	Т4									9.	+3
Norr	naldist	ribution- G	ammadi	istribution- Beta	distributi	on (without proble	ems) - Exp	ponenti	al dist	ributio	on.
UNI	Т 5									9-	+3
Corr	elatior	i: Karl Pea	rson co	efficient of cor	relation-F	ank correlation -	- Regressi	ion: Li	near r	egress	sion –
Regr	ression	coefficient	– prope	erties of regressi	on coeffic	ients – related pro	blems.				
L	ecture	2	45	Tutorial	15	Practical	0		Tota	ıl	60
Text	Book			I	1 I		I	I		I	

- "Fundamentals of Mathematical Statistics", S.C. Gupta, V.K. Kapoor, Sultan Chand & Sons, 2014 (11th revised edition)
- Unit I : Chapter 5 (Sec. 5.1 5.4)
- Unit II : Chapter 5 (Sec. 5.5- 5.5.6)
- Chapter 6 (Sec. 6.1 6.5)
- Unit III: Chapter 7 (Sec.7.1-7.3.1)
- Chapter8(Sec.8.4, 8.4.1, 8.4.2, 8.4.5, 8.4.6, 8.5, 8.5.2 8.5.5)
- Unit IV: Chapter 9 (Sec.9.2, 9.2.1-9.2.3, 9.2.5, 9.2.11, 9.3, 9.5, 9.8)
- Unit V : Chapter 10 (Sec.10.2-10.4& 10.7)

Chapter 11 (Sec.11.1-11.2.2)

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- 2. http://www.bath.ac.uk/catalogues/2019-2020/ma/MA10211.html [University of Bath, United Kingdom

			CO	s vs POs					
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	3	1	0	1	1
CO 2	3	3	2	1	3	1	0	1	1
CO 3	3	3	3	2	3	1	1	1	1
CO 4	3	3	2	1	3	1	0	1	1
CO 5	3	3	3	2	3	1	1	1	1
TOTAL	15	15	12	7	15	5	2	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1

 $1\textbf{-}5 \rightarrow \textbf{1}, \textbf{6-}10 \rightarrow \textbf{2}, \textbf{11-}15 \rightarrow \textbf{3}$

Co	ourse N	Name]	Mathematica	al Stati	stics Practica	al - I	L	Т	P	С
C	ourse	Code			XMT	304		0	0	4	2
С	Р	Α						L	Т	Р	Н
2	0	0						0	0	4	2
Prei	requisi	te						I	I	I	
On s	success	ful com	pletion	of this course	e, the st	tudents will b	e able to:				
			C	ourse Outco	mes			Dom	ain	Le	evel
CO 1	1			oncept of disc olve the prob		nd continuous	random	Cogn	itive	Applyi	ng
CO2	2	variab	les to ution of	find the	margi	-dimensional nal and con d continuous	nditional	Cogn	itive	Applyi	ng
CO3	3		the me on distri		and 1	ngf of binor	nial and	Cogn	itive	Unders	standing
CO4	4	Apply	the co		n distri	bution to find	the area	Cogn	itive	Applyi	ng
COS	5	Apply	the co		elation	and regressio	n to	Cogn	itive	Applyi	ng
UNI	T 1	50110						ļ			6
Rano	dom va	ariables-	Discre	te distribution	n functi	ion - continuo	us randon	n varia	ble- Pr	obabili	ty
dens	sity fun	ction – (Continu	ous distribut	ion fun	ction.					
UNI	[T 2]	1							1		6
Two	o-dimer	nsional r	andom	variable: joir	nt proba	ability mass fu	unction –	continu	ious pr	obabili	ity
func	tion - I	Marginal	l Distri	bution Functi	on -Ma	thematical Ex	xpectation	s - Pro	perties	of	
expe	ectatior	n – Prope	erties o	f variance – s	imple j	problems only	7				
UNI	T 3	ĺ							ĺ		6
M.G	$\mathbf{F} - \mathbf{C}$	umulant	s - Cha	racteristic Fu	nctions	- Binomial, I	Poisson di	stributi	ions – I	Mome	nts,
mod	le and I	MGF on	ly								
UNI	T 4										6
Nori	maldist	tribution	- Gamı	nadistributio	n- Beta	distribution -	Exponen	tial dis	tributic	n	
UNI	I T 5										6
					f correl	ation–Rank c	orrelation	– Regi	ression	: Linea	r
_				oefficient.	Δ	Des et 1		. 1		.	20
Le	ecture		0	Tutorial	0	Practical	30		Tota	L	30

Text Book

1. S.C. Gupta, V.K. Kapoor, Elements of Mathematical Statistics, Sultan Chand & Sons, Educational

Publishers, New Delhi, 3rd Edition, Reprint 2008.

Reference

1. Dr. P.R. Vittal "Mathematical Statistics" Margham Publications Chennai, 2009.

- 1. https://science.korea.edu/science_en/undergraduate/under_math3.do[Korea University college of science]
- 2. http://www.bath.ac.uk/catalogues/2019-2020/ma/MA10211.html[University of Bath, United Kingdom

			(COs vs P	Os				
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	3	1	1	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	2	1	3	1	0	1	1
CO 4	3	3	3	2	3	1	1	1	1
CO 5	3	3	3	2	3	1	1	1	1
TOTAL	15	15	11	9	15	5	4	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1
0 - No Relation			n, 2- Mee	dium Re	lation, (3- High	Relation		
$1-5 \rightarrow 1, 6-10$	$\rightarrow 2, 11-15$	$\rightarrow 3$							

Co	urse N	lame		Quanti	t <mark>ative</mark> A	ptitude - II		\mathbf{L}	T	Р	C
Co	ourse (Code			XMT.	805		2	0	0	2
C	Р	Α						L	Τ	Р	H
2	0	0						2	0	0	2
Prere	equisit	e	Basic h	igher secon	dary lev	el mathematica	al know	ledge.	I	I	ļ
On sı	uccessf	ful com	pletion of	this course,	the stu	dents will be al	ole to:				
			Co	urse Outco	mes			Don	nain	L	evel
CO1			-	c concepts of solve the p	-	and loss, ratio		Cogr	nitive	Apply	ying
CO2			ly the base the prob	1	of partr	ership, chain r	ule to	Cogr	nitive	Apply	ying
CO3		-		asic concept lve the prob		e & work, pipe	es	Cogr	nitive	Apply	ying
CO4		-		asic concept ains to solv		e & distance an oblems	nd	Cogr	nitive	Apply	ying
CO5		-		asic concept nixture to so		ats and streams problems	and	Cogr	nitive	Apply	ying
UNI	Г 1										6
Profit	t & Lo	ss, Rati	o & Propo	ortion.							
UNI	Г 2										6
Partn	ership	Chain	Rule.								
UNI	Г З										6
Time UNI		rk, Pipe	s& Cister	ns							6
Time	s & Di	stance,	Problems	on Trains.					ļ		
UNI	Г 5										6
Boats	s & Str	eams, A	Iligation	or Mixture.							
Le	cture		30	Tutorial	0	Practical	()	Tota	al	30
Text	Book	I	I		I					I	
1.		Aggary on (2013		ntitative A	ptitude	for Competitiv	ve Exa	minatio	ons, S	Chan	d; 20
Refe	rences										

- 1. Banking awareness by Sangram Keshari Rout and Soumya Ranjan Behera, B.K. Publications Pvt. Ltd.; Second edition (2014).
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- 3. Fast Track Objective Arithmetic by Rajesh Verma, Arihant Publication, Edition 2012.

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			C	Os vs PC)s				
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	3	1	1	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	3	2	3	1	1	1	1
CO 4	3	3	3	2	3	1	1	1	1
CO 5	3	3	3	2	3	1	1	1	1
TOTAL	15	15	15	10	15	5	5	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1
0 - No Relation,	1 – Low H	Relation,	2- Medi	um Rela	tion, 3-	High R	elation		
$1-5 \rightarrow 1, 6-10 \rightarrow$	2, 11-15 –	→3							

C	Course	Name	DISASTERMANAGEMENT	L	Т	Р	C
C	Course	Code	XUM003	1	0	0	1
С	Р	Α		L	Т	SS	H
1	0	0		1	0	1	2
Pro	requis	ite	Basic knowledge about environment.				
	-						
On s	success	siui compi	etion of this course, the students will be able to:	I _	- 1	_	_
		1	Course Outcomes	Dom	ain	Lev	vel
CO 1	1		tandingtheconceptsofapplicationoftypes	Cogn e	itiv	Apply	
	า		terpreparedness eendconditions& Discuss thefailuresduetodisaster.	Cogn	itiv	Analyz	0
CO	2	menuie		e	111 V	Anaryz	C
CO3	3	Unders	tanding of importance of seismic waves	Cogn	itiv	Analyz	e
		occurrin	g globally	e			
CO4	4	Estimat	eDisasterandmitigationproblems.	Cogn	itiv	Apply	
CO	5	Keen kn	owledge onessentialsofriskreduction	e Cogn	itiv	Apply	
~~		110011111		Cogn	101 1	· · PP·J	
				e			
UNI	IT 1	INTRO	DUCTION	e		3	•
Intro	oductio	 on–Disaste	prpreparedness–GoalsandobjectivesofISDRProgram	mme-R		3	•
Intro iden	oductio tificati	on–Disaste ion – Risk	erpreparedness–GoalsandobjectivesofISDRProgram sharing – Disaster and development: Developmen	mme-R nt plans	and	-	
Intro iden disa	oductio tificati sterma	 on–Disaste ion – Risk nagement-	erpreparedness–GoalsandobjectivesofISDRProgram sharing – Disaster and development: Developmen –Alternative to dominant approach – disaster – dev	mme-R nt plans	and	-	
Intro iden disa Prin	oductio tificati sterma cipleot	 on–Disaste ion – Risk nagement- frisk partn	erpreparedness–GoalsandobjectivesofISDRProgram sharing – Disaster and development: Developmen –Alternative to dominant approach – disaster – dev ership.	mme-R nt plans velopm	and	linkages	_
Intro iden disa Prin	oductio tificati sterma cipleot	 on–Disaste ion – Risk nagement- frisk partn	erpreparedness–GoalsandobjectivesofISDRProgram sharing – Disaster and development: Developmen –Alternative to dominant approach – disaster – dev ership. CATIONOFTECHNOLOGY INDISASTERRI	mme-R nt plans velopm	and	-	_
Intro iden disa: Prin UNI	oductio atificati sterma cipleo IT 2	on–Disaste ion – Risk nagement- frisk partn APPLI REDU(erpreparedness–GoalsandobjectivesofISDRProgram sharing – Disaster and development: Developmen –Alternative to dominant approach – disaster – dev ership. CATIONOFTECHNOLOGY INDISASTERRI CTION	mme-R nt plans velopm SK	and ent	linkages 3	_
Intro iden disa Prin UNI	oductic atificati sterma cipleo IT 2 llicatio	Dn–Disaste ion – Risk inagement- frisk partn APPLIC REDUC	erpreparedness–GoalsandobjectivesofISDRProgram sharing – Disaster and development: Developmen –Alternative to dominant approach – disaster – dev ership. CATIONOFTECHNOLOGY INDISASTERRI	mme-R nt plans velopm SK	and ent	linkages 3 ystems-	_
Intro iden disa: Prin UNI App Deci	oductic tificati sterma cipleot IT 2 Vlicatio ision s	Dn-Disaste ion – Risk inagement- frisk partn APPLIC REDUC nofvarious upport sys	erpreparedness–GoalsandobjectivesofISDRProgram sharing – Disaster and development: Development –Alternative to dominant approach – disaster – development ership. CATIONOFTECHNOLOGY INDISASTERRI CTION stechnologies:Databases–RDBMS–ManagementIr	mme-R nt plans velopm SK nformat	and ent ionSy s – Int	linkages 3 /stems- tranets	_
Intro iden disa: Prin UNI App Deci	oductic tificati sterma cipleot IT 2 dicatio ision s extrane	Dn-Disaste ion – Risk inagement- frisk partn APPLIC REDUC nofvarious upport sys ets-videote	erpreparedness–GoalsandobjectivesofISDRProgram sharing – Disaster and development: Development –Alternative to dominant approach – disaster – dev ership. CATIONOFTECHNOLOGY INDISASTERRI CTION stechnologies:Databases–RDBMS–ManagementIr tem and other systems – Geographic information s	mme-R nt plans velopm SK nformat	and ent ionSy s – Int	linkages 3 /stems- tranets	_
Intro iden disas Prin UNI App Deci ande	oductic itificati sterma cipleot IT 2 llicatio ision s extrane	Din-Disaste ion – Risk inagement- frisk partn APPLIC REDUC nofvarious upport sys ets-videote	erpreparedness–GoalsandobjectivesofISDRProgram sharing – Disaster and development: Development –Alternative to dominant approach – disaster – development ership. CATIONOFTECHNOLOGY INDISASTERRI CTION stechnologies:Databases–RDBMS–ManagementIr tem and other systems – Geographic information steleconferencing.Triggermechanism–Remotesensin	mme-R nt plans velopm SK nformat	and ent ionSy s – Int	linkages 3 /stems- tranets	
Intro iden disa Prin UNI App Deci ande cont	oductic tificati sterma cipleot IT 2 llicatio ision s extrane tributic IT 3	on–Disaste ion – Risk inagement- frisk partn APPLIC REDUC nofvarious upport sys ets–videote onof remot AWAR	erpreparedness–GoalsandobjectivesofISDRProgram sharing – Disaster and development: Development –Alternative to dominant approach – disaster – development ership. CATIONOFTECHNOLOGY INDISASTERRI CTION stechnologies:Databases–RDBMS–ManagementIr tem and other systems – Geographic information st eleconferencing.Triggermechanism–Remotesensin esensing and GIS-Casestudy.	mme-R at plans velopm SK aformat systems ag-anins	and ent ionSy s – Int sight–	linkages 3 /stems- tranets - 3	
iden disas Prin UNI App Deci ande cont UNI Trig	oductic tificati sterma cipleot IT 2 dicatio ision s extrane tributic IT 3 sgerme	on–Disaste ion–Risk inagement- frisk partn APPLIQ REDUC nofvarious upport sys ets–videote onof remot AWAR chanism–c	erpreparedness–GoalsandobjectivesofISDRProgram sharing – Disaster and development: Development –Alternative to dominant approach – disaster – development ership. CATIONOFTECHNOLOGY INDISASTERRI CTION stechnologies:Databases–RDBMS–ManagementIr tem and other systems – Geographic information st eleconferencing.Triggermechanism–Remotesensin esensing and GIS-Casestudy. ENESSOF RISKREDUCTION	mme-R at plans velopm SK aformat systems ag-anins	and ent ionSy s – Int sight–	linkages 3 /stems- tranets - 3	
Intro iden disa: Prin UNI App Dec: ande cont UNI Trig Info	oductic tificati sterma cipleot IT 2 llicatio ision s extrane cributic IT 3 germe rmatio	Dn-Disaste ion – Risk inagement- frisk partm APPLIC REDUC nofvarious upport sys ets-videote onof remot AWAR chanism-connetwork-	erpreparedness–GoalsandobjectivesofISDRProgram sharing – Disaster and development: Development –Alternative to dominant approach – disaster – development ership. CATIONOFTECHNOLOGY INDISASTERRI CTION stechnologies:Databases–RDBMS–ManagementIr tem and other systems – Geographic information steleconferencing.Triggermechanism–Remotesensin esensing and GIS-Casestudy. ENESSOF RISKREDUCTION constitutionoftriggermechanism–riskreductionbyeo	mme-R at plans velopm SK aformat systems ag-anins	and ent ionSy s – Int sight–	linkages 3 /stems- tranets - 3	
Intro iden disas Prin UNI App Deci ande cont UNI Trig Info UNI	oductic tificati sterma cipleot IT 2 elicatio ision s extrane tributic IT 3 germe rmatio IT 4	on–Disaste ion – Risk inagement- frisk partn APPLIQ REDUC nofvarious upport sys ets–videote onof remot AWAR chanism–Connetwork- DEVEI	erpreparedness–GoalsandobjectivesofISDRProgramsharing – Disaster and development: Development-Alternative to dominant approach – disaster – development. CATIONOFTECHNOLOGY INDISASTERRIC CATIONOFTECHNOLOGY INDISASTERRIC CATIONOFTECHNOLOGY INDISASTERRIC CATIONOFTECHNOLOGY INDISASTERRIC Catechnologies:Databases–RDBMS–ManagementIr tem and other systems – Geographic information seleconferencing.Triggermechanism–Remotesensin esensing and GIS-Casestudy. ENESSOF RISKREDUCTION constitutionoftriggermechanism–riskreductionbyece- risk reduction bypublicawareness. COPMENTPLANNING ONDISASTER	mme-R at plans velopm SK aformat systems ag-anins ducatio	and ent 1 ionSy s – Int sight– n–disa	linkages 3 vstems- tranets - 3 aster 3	
Intro iden disa: Prin UNI App Deci ande cont UNI Trig Info UNI Impl	oductic tificati sterma cipleot IT 2 dicatio ision s extrane tributic IT 3 germe rmatio IT 4 licatio	on–Disaste ion – Risk inagement- frisk partn APPLIQ REDUC nofvarious upport sys ets–videote onof remot AWAR chanism–connetwork- DEVEI nofdevelop	erpreparedness–GoalsandobjectivesofISDRProgramsharing – Disaster and development: Development-Alternative to dominant approach – disaster – development. CATIONOFTECHNOLOGY INDISASTERRI CATIONOFTECHNOLOGY INDISASTERRI CTION Stechnologies:Databases–RDBMS–ManagementIr tem and other systems – Geographic information seleconferencing.Triggermechanism–Remotesensin esensing and GIS-Casestudy. ENESSOF RISKREDUCTION constitutionoftriggermechanism–riskreductionbyect- risk reduction bypublicawareness.	mme-R nt plans velopm SK nformat systems ng-anins ducation	and ent distribution ionSy s – Int sight– n–distribution nent–	linkages 3 vstems- tranets - 3 aster 3	
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	15	Tutori	al -	Pr	ractical		-	Total	15
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1.SiddharthaC	autamandK	Leelakri	ishaRao	,"Disaste	erMana	gementPr	ogramme	esand	
	istaInternati								
2. ArunKumar	,"GlobalD1s	asterMa	nagemei	nt",SBSI	Publish	ers,2008			
References 1. "Encyclop	adioOfDisc	otor Mo	nagama	nt" Noho	Dublie	hars & Dig	tributora	2008	
 2. PardeepSał 			-						»" DЦI ′
2. 1 arucepsai 002	1111,1 v 1au11av1	maiaigo	uaanuai	Tyabanu	u, Disa	SICILISKIC	auctionin	ISOUIIASI	a ,1111,4
	nal,"Underst	andinge	arthauak	redisaste	rs"TM	H 2010			
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",PHI, 2000	-	incjaan	10mann	July, D	15451011	initigatioi	петрепс	neesanure	neenon
,1111, 2000	5								
E-References									
http://icom.mus						-		10	
http://www.inter	rnational.icc	mos.org		<u>docume</u> Os vs P		/b1b/r1skp	reparedn	ess.pdf	
					- ·-				
	PO 1	PO	PO3	PO4	PO	PO6	PO7	PO8	PO9
		2			5				
CO 1	3	2 3	3	2	5 3	1	1	1	1
	3 3		3	2 3		1	1 2	1	1
CO 2		3			3				
CO 2 CO 3	3	3	3	3	3	1	2	1	1
CO 1 CO 2 CO 3 CO 4 CO 5	3	3 3 3	3	3	3 3 3	1	2	1	1
CO 2 CO 3 CO 4	3 3 3	3 3 3 3	3 3 3	3 3 2	3 3 3 3	1 1 1	2 2 1	1 1 1	1
CO 2 CO 3 CO 4 CO 5 TOTAL	3 3 3 3 15	3 3 3 3 3 15	3 3 3 3 15	3 3 2 2 12	3 3 3 3 3 15	1 1 1 1 5	2 2 1 1 7	1 1 1 1 5	1 1 1 1 5
CO 2 CO 3 CO 4 CO 5 TOTAL SCALED	3 3 3 3 3	3 3 3 3 3 3	3 3 3 3	3 3 2 2	3 3 3 3 3	1 1 1 1	2 2 1 1	1 1 1 1 1	1 1 1 1
CO 2 CO 3 CO 4 CO 5 TOTAL	3 3 3 3 15	3 3 3 3 3 15	3 3 3 3 15	3 3 2 2 12	3 3 3 3 3 15	1 1 1 1 5	2 2 1 1 7	1 1 1 1 5	1 1 1 1 5
CO 2 CO 3 CO 4 CO 5 FOTAL SCALED	3 3 3 3 15 3	3 3 3 3 3 15 3	3 3 3 3 15 3	3 3 2 2 12 3	3 3 3 3 3 15 3	1 1 1 5 1	2 2 1 1 7 2	1 1 1 1 5	1 1 1 1 5

SEMESTER IV

Co	ourse	Name			Ab	ostra	ct A	lge	ebr	a					Ι		T	1	Р	(2
Co	ourse	Code				XN	MT4	01								3	1		0	4	1
С	P	Α													Ι		T	1	Р	I	I
4	0	0														3	2		0	5	5
Prer	equis	ite	Highe	er Seco	ndary	leve	el M	ath	nem	atic	s				Ι				I	I	
On s	ucces	sful con	pletion	of this	cours	se, th	ie sti	ude	ents	wi	11 bo	e a	ble	to:							
			(Course	Outco	ome	S								D	om	ain		L	evel	
CO1	l	Const	ruct Ca	yley tab	ole for	r the	give	en j	peri	nut	atic	n			Co	gni	tive	A	pply	ing	
		groups																			
CO2	2	Identi	f y the le	eft and r	right c	coset	of t	he	giv	en	sym	ım	etri	c	Co	gni	tive	A	pply	ing	
		group																			
CO3	3	Explai	n norm	al subg	roups	and	quo	tie	nt g	rou	ıps				Co	gni	tive	U	nder	stand	ling
CO4	ŀ	Explai	n the co	oncepts	of rin	ng an	nd its	s pi	rope	erti	es				Co	gni	tive	U	nder	stand	ling
CO5	5	Explai	n Integ	ral dom	ain ai	nd E	uclic	dea	ın d	om	ain				Co	gni	tive	U	nder	stand	ling
UNI	T 1																		9	+3	
	-	efinition		-	s – El	eme	ntary	y P	rop	erti	es c	of a	a Gi	rouj	9 – E	Equ	ivale	ent o	defin	ition	s of
a Gro UNI	-	Permuta	ation G1	roups.														1	q	+3	
		s – Cycli	ic Grou	ns – Or	der of	f an I	Elen	nen	nt —	Co	sets	ar	nd I	গ্ৰহা	ang	e's	The	 orer		10	
UNI	-								10	00			14 1	248.	un9		1110			+3	
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UNI		a group	y and Q	uotient	Croa	PS	1001		· P····			101			21110				9	+3	
Ring	s: De	finitions	and Ex	amples	– Ele	emen	ntary	' pr	ope	ertie	es o	f ri	ings	s – 1	som	orp	hisn	n –	Туре	s of	
rings	s – Ch	aracteri	stic of a	ring –	Subri	ngs -	– Ide	eals	s –	Qu	otie	nt	ring	gs.							
UNI	T 5																		9	+3	
Max	imal a	and Prin	ne Ideal	s – Hor	nome	orphi	sm o	of 1	ring	<u>s</u> –	Fie	eld	of	quo	tien	ts c	of an	Int	egral	dom	nain
– Un	ique	factoriza	tion do	main –	Eucli	dean	n dor	nai	in.												
Le	ecture		45	Tuto	orial	1	5		Pra	cti	cal			0			То	tal		60	
Text	t Bool	κ. Γ		I		I	I					I				I			I		
		Arumug l., Chen	-		hanga	apan	diIss	sac	, M	lod	ern	A	lge	bra,	Sci	iTe	ch F	Publ	icati	ons l	Pvt.

Unit I -Chapter 3 - Sections 3.1 to 3.4 Unit II -Chapter 3 - Sections 3.5 to 3.8 Unit III-Chapter 3 - Sections 3.9 to 3.11 Unit IV -Chapter 4-Sections 4.1 to 4.8 Unit V -Chapter 4 - Sections 4.9 to 4.11, 4.13 & 4.14 References

- 1. N. Herstein, Topics in Algebra, John Wiley & Sons, Student 2nd edition, 1975.
- 2. Vijay, K. Khanna and S.K. Bhambri, A course in Abstract Algebra, Vikas Publishing House Pvt. Ltd, 2017.
- 3. Dr. R. Balakrishnan and N. Ramabadran, A text book of Modern Algebra, Vikas Publishing House Pvt. Ltd, New Delhi, 1994.

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- 1. https://courses.maths.ox.ac.uk/node/43944[Oxford University]
- 2. https://courses.maths.ox.ac.uk/node/43955 [Oxford University]

			L L	.05 15 1	05				
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	3	1	1	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	2	1	3	1	0	1	1
CO 4	3	3	2	1	3	1	0	1	1
CO 5	3	3	2	1	3	1	0	1	1
TOTAL	15	15	12	7	15	5	2	5	5
SCALED						4		1	4
VALUE	3	3	3	2	3	1	1		I
0 - No Relation.	1 - Low	Relation	. 2- Mec	lium Re	lation. 3	S- High	Relation		

COs vs POs

Low Relation, 2- Medium Relation, 3elation. I

 $1\text{-}5 \rightarrow 1, 6\text{-}10 \rightarrow 2, 11\text{-}15 \rightarrow 3$

Co	ourse N	Name			Mecha	nics		L	Т	P	С
Co	ourse (Code			XMT4	402		3	1	0	4
C	Р	Α						L	Т	Р	Н
4	0	0						3	2	0	5
Prer	equisi	te	Basic	Physics kno	wledge			I	I	I	
On s	uccess	ful com	pletion	of this cours	e, the st	udents will be a	able to:				
			C	Course Outco	omes			Dom	ain	Le	evel
CO1	l	-		out forces, ve	•		11	Cogn	itive	Unders	standing
			ients, co geometr	-	on etc.,	in trigonometric	cally				
CO2	2	Expl	ain Ne	wton's laws		on and equilibri	um of	Cogn	itive	Unders	standing
CO3	k			g on a rigid b	•	barallel forces,		Cogn	itive	Applyi	na
	,			nd couples in				Cogn		трргу	ng
CO4						notion and proje	ectiles	Cogn		Analyz	U
CO5 UNI		Anal	yze the	e equation of	central	orbits		Cogn	itive	Analyz	ing 1 2
		ants and	mminair	alag Earaga	acting	t a naint Lami'	a theorem	mand	annlia	_	
		-			-	t a point-Lami's at ofaforce– Cou					Paralle
UNI			<u></u>				opros 1		proofe		2
Eaui	libriun	n of thre	e force	s acting on a	rigid bo	ody-Friction- La	aws of fi	riction	-Angle	of fric	tion-
Cone	e of fri			es and related	-	•					
UNI	Т3]	12
		-				ation - Newton ned plane- Prop				ojectile	es:
UNI			<u>510</u> jeet	ile Runge on	un men					1	12
Impt	ulse an	d Impac	t: Colli	sion of elasti	c Bodie	s–Direct and ob	olique in	npact-	Loss of	f Kinet	ic
		lated Pro	operties	s and Simple	Probler	ns.			1	-	
UNI											12
						entral Forces -	-				
		-		and related F	-	uation of centra	al orbit-	Veloci	ties in a	a centr	al orbit
	ecture	-	45	Tutorial	15	Practical	0		Tota	1	60
Le	ctul c			1 utoriur	10	Tucticui	Ū		1000		00
Le											
	Book	S								<u> </u>	
Text 1. N	M.K.Ve Unit1:		s2,3,4	Statics",Agas	thiarPut	olications, Trich	y,2004.				

Unit3:Chapters3: section3.22,Chapter4:Section4.3,Chapter6 Unit4:Chapter 8 Unit5:Chapter11

References

T.K.ManickavasagamPillai, "Statics", S.Viswanathan&Co., Chennai, 1980.
 S.Narayanan, "Dynamics", S.Chand&Co., NewDelhi, 1980.

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http://nptel.ac.in

			(COs vs P	Os				
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	3	1	0	1	1
CO 2	3	3	2	1	3	1	0	1	1
CO 3	3	3	3	2	3	1	1	1	1
CO 4	3	3	3	3	3	1	2	1	1
CO 5	3	3	3	3	3	1	2	1	1
TOTAL	15	15	13	10	15	5	5	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1
0 - No Relation	n, 1 – Low I	Relation	, 2- Mec	lium Re	lation, 3	3- High	Relation	<u> </u>	
$1-5 \rightarrow 1, 6-10$	→ 2, 11-15 -	→3							

C	ourse	e Name	Mathematical Statistics - II	L	Т	Р	C			
C	Course	e Code	ХМТ403	3	1	0	4			
C	Р	Α		L	Т	Р	Н			
4	0	0		3	2	0	5			
Pre	requis	site	Basic knowledge of random variables and dis	tribution	s.	I				
On s	succes	sful comp	letion of this course, the students will be able to):						
			Course Outcomes	Dom	ain	Leve	el			
CO	1	Explain	n the test of significance for large sampling	Cogni	itive 1	Understa	ndin			
CO	2	Explain	n the chi square distribution	Cogni	itive 1	g Understa	ndin			
CO	tive 1	Understa	ndin							
		٤	g							
CO	4	Explain	n the F distribution	itive 1	Understandin					
			g							
CO	5	Classif	y the various types of analysis of variance	Cogni	itive 1	Understa	ndin			
IINI	T 1	Large	sampling theory		2	g 12				
			test of significance- null hypothesis- error in sa	mnling_	critical r					
leve	l of si		- test of significance for large- samples- sampli			egions e	ina			
UNI	IT 2	χ^2 Dis	tribution			12				
and App	skewi	hess - addi on of χ^2 -	tion of the χ^2 distribution (Method of M.G.F o tive property - χ^2 probability curve - Theorem <u>distribution: Inference about a population varian</u> t's t-distribution	s on χ^2	listribut	ion -				
t-dis		ion - test o	ribution - constants of t-distribution- limiting o of single mean, difference of mean. ribution	f t-distril	oution-	applicati 12	on o			
dist	ributic	on - test	ribution- constant of F-distribution- mode of F- for equality of two population variance (o	only sim	ple pro					
	ributic IT 5		tion between t and F and relation between F and is of Variance	$d \chi^{} test$	s.	12				
. .	duati	on one	way, two-way classifications - Experimental	dagiang	· Dande	mized	1 -1			

design - Latin	squares.						
Lecture	45	Tutorial	15	Practical	0	Total	60

Text Books

1. Fundamentals of mathematical statistics, S.C Gupta, V. K. Kapoor (11th edition) - Sultan Chand & Sons 2002.

Unit I : Chapter: 14 (Sec. 14.1 – 14.7.2)

Unit II : Chapter: 15 (Sec. 15.1-15.4, 15.6(15.6.1-15.6.2))

- Unit III :Chapter: 16 (16.2, 16.3(16.3.1, 16.3.2))
- Unit IV :Chapter: 16(16.5-16.8)
- 2. 'Statistical Methods' Vol. II, Dr. S.P. Gupta, Sultan Chand & Sons 2008. Unit V:Chapter: 5, 6

Reference

1. Dr. P.R. Vittal "Mathematical Statistics" Margham Publications Chennai, 2009.

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1.https://acadinfo.wustl.edu/CourseListings/CourseInfo.aspx?sem=FL2020&sch=L&dept=L24& crs=494[Washington University]

2.https://www.maths.cam.ac.uk/undergrad/files/coursesIB.pdf [Cambridge]

	COs vs POs										
	PO 1	PO	PO3	PO4	PO	PO6	PO7	PO8	PO9		
		2			5						
CO 1	3	3	2	1	3	1	0	1	1		
CO 2	3	3	2	1	3	1	0	1	1		
CO 3	3	3	2	1	3	1	0	1	1		
CO 4	3	3	2	1	3	1	0	1	1		
CO 5	3	3	2	1	3	1	0	1	1		
TOTAL	15	15	10	5	15	5	0	5	5		
SCALED	_		_	_	_	_	_	_			
VALUE	3	3	2	1	3	1	0	1	1		
0 - No Relation, 1	l – Low F	Relatior	n, 2- Me	dium R	elation	, 3- Hig	h Relation	1			

CO DO

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$

(Course	Name	Mathem	atical Sta	tistics Practic	al - II	L	Т	Р	C		
	Course	e Code		XM	T404		0	0	4	2		
С	Р	Α					L	Т	Р	H		
2	0	0					0	0	4	2		
Pre	requis	ite	Basic know	ledge of ra	ndom variable	es and dis	stributio	ns.		I		
On	succes	sful compl	etion of this c	course, the	students will b	be able to	D:					
			Course Ou	itcomes			Doma	ain	Leve	1		
CO	1	Explain related p	-	of large sau	mples and solv	ve the	Cogni	tive	Applying			
CO2Solve the problems by using χ^2 DistributionCognitiveCO3Solve the problems by usingt- test of single mean,Cognitive												
CO	3		e problems by ce of mean.	y usingt- te	est of single mo	ean,	Cogni	tive	Applying			
CO										Applying		
CO	O5 Explain the concept of analysis of variance to solve the problems by using methods such as one-way, two-way classifications, randomized block design and Latin squares											
UN	IT 1		ampling theo	ory		I			6			
			-		hypothesis- en	rror in sa	mpling-	Critica	l regions a	and		
		gnificance-	• test of signif	icance for	large sample.			I	_			
UN	IT 2	χ^2 Dist	ribution						6			
			eorems on χ^2 e – goodness		on - Applicatio	on of χ^2 .	- distribı	ition: Ir	nference a	bout		
	TT 3		² s t-distribut						6			
Def	inition	of t-distril	oution- applic	ation of t-	distribution - to	est of sin	gle mea	n. diffe	rence of n	nean		
	IT 4	F-distri							6			
	inition	of F-dist	ibution- appl	ication of	F-distribution	n - test fo	or equal	ity of t	two popul	atio		
Def				f F- distrib			-	-				
		only simpl	e problems of	-					6			
vari			s of variance						U			
vari UN Intr	iance ((IT 5 roductio	Analysian - one-w	s of variance		ations – Expe	erimental	design	s: Rano		bloc		
vari UN Intr des	iance ((IT 5 roductio	Analysi on - one-v atin square	s of variance way, two-way	y classific	ations – Expe	erimental	design	s: Rano	domized	blocl		

- Fundamentals of mathematical statistics, S.C Gupta, V. K. Kapoor (11th edition) Sultan Chand & Sons2002. Unit I:Chapter: 14 (Sec. 14.1 – 14.7.2) Unit II:Chapter: 15 (Sec. 15.1- 15.4, 15.6(15.6.1-15.6.2)) Unit III:Chapter: 16 (16.2, 16.3(16.3.1, 16.3.2)) Unit IV:Chapter: 16(16.5- 16.8)
- 2. 'Statistical Methods' Vol. II, Dr. S.P. Gupta, Sultan Chand & Sons 2008. Unit V: Chapter: 5, 6

Reference

1. Dr. P.R. Vittal "Mathematical Statistics" Margham Publications Chennai, 2009.

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1. https://acadinfo.wustl.edu/CourseListings/CourseInfo.aspx?sem=FL2020&sch=L&dept=L24&crs=494[Washington University]

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2. <u>https://www.maths.cam.ac.uk/undergrad/files/coursesIB.pdf</u> [Cambridge]

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COs vs POs												
	PO 1	Р	PO3	PO4	Р	PO6	PO7	PO8	PO9			
		0			0							
		2			5							
CO 1	3	3	3	2	3	1	1	1	1			
CO 2	3	3	3	2	3	1	1	1	1			
CO 3	3	3	3	2	3	1	1	1	1			
CO 4	3	3	3	2	3	1	1	1	1			
CO 5	3	3	3	2	3	1	1	1	1			
TOTAL	15	15	15	10	15	5	5	5	5			
SCALED VALUE	3	3	3	2	3	1	1	1	1			
0 - No Polation		 	n 2 M	 dium l	 Dolati	ion 3 L	Jigh Dolation					

0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation

 $1\textbf{-}5 \rightarrow 1, \textbf{6-}10 \rightarrow 2, \textbf{11-}15 \rightarrow 3$

Co	ourse l	Name		Quanti	tative A	ptitude -	III		L	Т	P	C		
COU	URSE	CODE			XMT	405			2	0	0	2		
С	Р	Α							L	T	P	Н		
2	0	0							2	0	0	2		
Prer	equisi	ite	Basic	mathematic	al know	ledge.			I	I	I	I		
On s	uccess	sful com	pletion	of this cours	e, the st	udents wil	l be ab	ole to:						
			C	Course Outc	omes				Don	nain	L	evel		
CO1	l		simple proble	e interest and ems	l compo	und intere	st of th	e	Cogn	itive	Reme	mberin		
CO2	2	Find	the are	a of the bou	nded re	gion			Cogn	itive	Reme	mberin		
CO3	;	Find	the vol	ume and sur	face are	a of the given the given the given the second s	ven reg	gion	Cogn	itive	Reme	mberin		
CO4	ŀ		the ang	de between t	he hour	hand and	minute	e	Cognitive Remember					
CO5	5	Find prob	-	mutations ar	nd comb	inations of	f the gi	iven	Cognitive Remember					
UNI	T 1								1			6		
-	-	erest, Co	mpoun	d Interest.										
UNI												6		
Loga	arithm	s, Area.												
UNI	Т3											6		
		Surface	Areas,	Races & Ga	mes of	Skill.								
												6		
		Clocks.								1				
UNI												6		
		1		tions & Com	1	1	1		1		I			
Le	ecture		30	Tutorial	15	Practi	cal	0		Tot	al	30		
	Book										• • th			
	.S. Ag 2013)	garwal,	Quantit	ative Aptitud	de for C	ompetitive	e Exam	iinatior	is, S C	hand;	20 ⁴⁴ ec	lition		
Refe	erence	s												
1		0		s by Sangran			d Soun	nya Ra	njan B	ehera,	B.K.			
2				td.; Second ET by Dr. P		. ,	Anshi	ıman. A	Arihan	t Publi	ication			
-				ve Arithmeti										

- 1. www.careerbless.com
- 2. www.jagranjosh.com
- 3. www.bestguru.com

			C	Os vs P	Os				
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	1	0	3	1	0	1	1
CO 2	3	2	1	0	3	1	0	1	1
CO 3	3	2	1	0	3	1	0	1	1
CO 4	3	2	1	0	3	1	0	1	1
CO 5	3	2	1	0	3	1	0	1	1
TOTAL	15	10	5	0	15	5	0	5	5
SCALED	3	2	1	0	3	1	0	1	1
VALUE									
0 - No Relation, 1	- Low]	Relation	, 2- Med	ium Re	ation, 3	- High I	Relation	ı I	
$1-5 \rightarrow 1, 6-10 \rightarrow 2$	2, 11-15 -	→ 3							

Co	ourse l	Name	Entrepreneurship Development	L	Т	Р	С
Co	ourse	Code	XUM004	1	0	0	1
С	Р	Α		L	Т	SS	Н
2	0	0		1	0	1	2
Prei	Prerequisite Basic skills like critical thinking, creativity, ris networking, leadership.					em-sc	olving,

On successful completion of this course, the students will be able to:

	Course Outcomes	Domain	Level
CO1	Understand the concept of Entrepreneurship	Cognitive	Understanding
CO2	Understand about an Entrepreneur	Cognitive	Understanding
CO3	Understand the characteristics of Entrepreneur	Cognitive	Understanding
CO4	Understand the ways to acquire skills of Entrepreneur	Cognitive	Understanding
CO5	Understand the concept of Intrepreneurship	Cognitive	Understanding

UNIT 1 INTRODUCTION TO ENTREPRENEURSHIP

3+**3**

Meaning and Concept of Entrepreneurship, History of Entrepreneurship Development, Role of Entrepreneurship in Economic Development, Myths about Entrepreneurs, Agencies in Entrepreneurship Management and Future of Entrepreneurship.

UNIT 2 THE ENTREPRENEUR

3+**3**

Gender Discrimination in society and in family, Gender equity, equality, and empowerment. Social and Economic Status of Women in India in Education, Health, Employment, Definition of HDI, GDI and GEM. Contributions of Dr.B.R. Ambethkar, ThanthaiPeriyar and Phule to Women Empowerment.

UNIT 3 CHARACTERISTICS OF AN ENTREPRENEUR

3 + 3

Introduction - Characteristic Features of Successful Indian Entrepreneurs - Differences between an Entrepreneur and a Manager - Difference between an Entrepreneur and an Intrapreneur - Relationship between the terms Entrepreneur, Entrepreneurial and Entrepreneurship - Difference between a Scientist, Inventor and Entrepreneur - Relationship between Entrepreneur and Enterprise - Difference between Entrepreneur and Enterprise -Difference between a Self-employed person and Entrepreneur - Common Myths on Entrepreneur.

UNIT 4	SKILLS FOR AN ENTREPRENEUR	3 + 3

Business Management Skills - Communication and active listening skills - Risk-taking skills - Networking Skills - Critical Thinking Skills - Problem Solving Skills - Creative Thinking Skills - Customer Service Skills - Financial Skills - Leadership Skills - Time Management and Organizational Skills - Technical Skills.

UNIT 5 INTRAPRENEURSHIP

3+3

What is Intrapreneurship? – Understanding Intrapreneurship – Types of Intrapreneurs – Characteristics of Intrapreneurs – Examples of Intrapreneurship.

Lecture	15	Self -	15	Total	30
		Study			

Text Book

1. Jayashree Suresh, Entrepreneurial Development, Margham Publications.

References

1.Essentials of Entrepreneurship and Small Business Management (6th Edition) by Norman M. Scarborough

(Paperback - Jan 13, 2010)

2. Entrepreneurship and Small Business Management, Student Edition by Glencoe McGraw-Hill (Hardcover -

Feb 24, 2005)

3. Vasant Desai, Dynamics of Entrepreneurship Development, Star Publication, New Delhi.

E-References

1. https://in.indeed.com/career-advice/career-development/entrepreneur-skills

2. https://www.investopedia.com/terms/i/intrapreneurship.asp

			(COs vs I	POs				
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	3	1	0	1	1
CO 2	3	3	2	1	3	1	0	1	1
CO 3	3	3	2	1	3	1	0	1	1
CO 4	3	3	2	1	3	1	0	1	1
CO 5	3	3	2	1	3	1	0	1	1
TOTAL	15	15	10	5	15	5	0	5	5
SCALED VALUE	3	3	2	1	3	1	0	1	1

0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation 1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3

SEMESTER V

Co	Course Name		Real Analysis	L	Т	P	С			
C	ourse	Code	XMT501	3	1	0	4			
С	Р	Α		L	Т	Р	Н			
4	0	0		3	2	0	5			
PRE	REQ	UISITE	Knowledge in the basic properties of real number	ers						
On s	uccess	sful comp	letion of this course, the students will be able to:							
			Course Outcomes	Dom	ain	Le	evel			
CO1		Explain	the basics of real numbers.	Cogni	tive	Unders	tanding			
CO2	2	Explain	the neighborhoods and limit points.	Cogni	tive	Unders	tanding			
CO3	5		trate about continuity and discontinuity of functions in different contexts.	Cogni	tive					
CO4	ŀ	Demons	trate about derivatives and continuity	Cogni	tive	Unders	tanding			
CO5	5	Explain theorems	the Riemann integration and mean value s.	Cogni	tive	Unders	tanding			
UNI	T 1	Real nu	mbers			9 -	+ 3			
			ield Properties-Order in R- Absolute value- Comp			epresen	tation			
of Ro UNI			a straight line – Intervals – Countable and Uncou orhoods and limit points	ntable	sets.	9 -	+ 3			
Oper	n sets ·	- Closed	sets –Limit points of a set – Closure of a set.							
UNI	Т3	Limits a	nd Continuity			9 -	+ 3			
			s functions – Types of discontinuities- Algebra of tinuous functions.	Contin	uous	functior	ns —			
UNI	T 4	Derivati	ves			9 -	+ 3			
			vability and continuity- Algebra of derivatives – I ux's theorem.	nverse	functi	on theo	rem for			
UNI						9.	+ 3			

Riemann Integration - Definition - Daurboux's theorem - conditions for integrability - properties of integrable functions – continuity and derivability of integral functions – Mean value theorems - the fundamental theorem of Calculus and the first mean value theorem.

Lecture	45	Tutorial	15	Practical	0	Total	60
Text Books		1	1		I	1	

I ext Books

1.M.K. Singhal and Asha Rani Singhal, "A first course in Real Analysis"., R. Chand & Co., June, 1997 (Units I to IV).

- 2. Shanthi Narayan, "A Course of Mathematical Analysis", S. Chand& Co. 1995 (Unit-V). Unit-I Chapter 1, Sec. 1.1 – 1.10
 - Unit-II Chapter 2 Sec 2.1 2.6
 - Unit-III Chapter 5 Sec 5.1 5.5
 - Unit IV Chapter 6 Sec 6.1 6.5

Unit – V Chapter 6 Sec 6.2, 6.3 & 6.5 6.7 6.8, 6.9 of [2]

Reference

- 1. Arumugam. S. and Thangapandi Issac, "Sequences and Series", New Gamma, Publishing House, Palayamkottai - 627 002, 1997.
- 2. Goldberg. R. "Methods of Real Analysis", Oxford and IBH Publishing Co., New Delhi (2000).
- 3. Arumugam and Issac, "Modern Analysis", New Publishing House, 2017.
- 4. Malik S.C and Savitha Arora, "Mathematical Analysis", 1991, Wiley Eastern Limited New Delhi.

E-References

1 https://nptel.ac.in

			(COs vs P	Os				
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	3	1	0	1	1
CO 2	3	3	2	1	3	1	0	1	1
CO 3	3	3	2	1	3	1	0	1	1
CO 4	3	3	2	1	3	1	0	1	1
CO 5	3	3	2	1	3	1	0	1	1
TOTAL	15	10	10	5	15	5	0	5	5
SCALED	3	2	2	1	3	1	0	1	1
VALUE									
0 - No Relation,	, 1 – Low	Relation	, 2- Med	lium Re	lation, 3	3- High]	Relation	1	

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$

Course Name Course Code			Discr	L	Т	P	C		
Co	ourse	Code			XMT502	3	1	0	4
С	Р	Α				L	Т	P	H
4	0	0				3	1	0	4
Prer	equisi	te	Highe	er Secondary l	evel Mathematics				
On s	uccess	ful com	pletion	of this course,	the students will be able to:				
			(Course Outco	mes	Dom	ain	I	evel
CO1 Solve second order recurrence relations by finding the corresponding generating functions						Cogn	itive	App	ying
CO2		given	logic sta	atements	properties of logic to simplify			App	
CO3	;			the given stat not using logi	ements are logically	Cogn	itive	Eval	uating
CO4	ļ		ze the b	00	s of lattice and Boolean	Cogn	itive	Anal	yzing
CO5	5		i fy diffe onships	rent formal la	nguage classes and their	Cogn	itive	App	ying
									+ 3
Recu evalu Solut	irrence uations tion of	- Recur	rence re	-	ction: Recurrence-an introduc on of finite order Homogeneo	-	•	als ar lation	d thei
Recu evalu Solut UNI	urrence uations tion of T 2	S- Recur Non-He	rence re omogen	lations- soluti eous relations	on of finite order Homogeneo	us (line	ar) Re	als ar lation	ad thei $s-\frac{1}{2}+3$
Recu evalu Solut UNI Logi	urrence uations tion of T 2 c: TF-	S- Recur Non-He	$\frac{1}{2}$	lations- soluti eous relations	on of finite order Homogeneo	us (line	ar) Re	als ar lation	ad thei $s-\frac{1}{2}+3$
Recu evalu Solut UNI Logi Form	urrence uations tion of T 2 c: TF- nulae –	s- Recur Non-He stateme	rence re omogen $\frac{1}{2}$ nts – co	lations- soluti eous relations	on of finite order Homogeneo	us (line	ar) Re	als ar lation 9 l (state	ad thei $s-\frac{1}{2}+3$
Recu evalu Solut UNI Logi Form UNI	arrence uations tion of T 2 c: TF- nulae – T 3	s- Recurr Non-He stateme parsing	rence re omogen onts – co g trees.	lations- soluti eous relations onnectives- ato	on of finite order Homogeneo	us (line s-well f	ar) Re	als ar lation 9 l (state	$\frac{1}{9+3}$
Recu evalu Solut UNI Logi Form Logi Form	arrence uations tion of T 2 c: TF- nulae – T 3 c: Trut nulae –	S- Recurr Non-Ho stateme parsing th table of	rence re omogen nts - cog trees.	lations- soluti eous relations onnectives- ato nula – Tautol	on of finite order Homogeneo	us (line s-well f	ar) Re formed	als ar lation 9 l (state 9 ence o ality	ad their s- 2 + 3 ement 2 + 3 of aw.
Recu evalu Solun UNI Logi Form Logi Form UNI	arrence uations tion of T 2 c: TF- nulae – T 3 c: Trut nulae – T 4	s- Recurr Non-He stateme parsing th table of Replace	rence re omogen onts – co g trees. of a forn ment pr	lations- soluti eous relations onnectives- ato mula – Tautol ocess- Functio	on of finite order Homogeneo mic and compound statement ogy- Tautological Implication onally Complete sets of conne	us (line s-well f s and Ec ctives a	ar) Re ormed quival nd Du	als ar lation 9 l (state 9 ence o ality	$\frac{1}{3} + 3$ ement $\frac{1}{3} + 3$
Recu evalu Solut UNI Logi Form UNI Logi Logi Logi Latti	arrence uations tion of T 2 c: TF- nulae – T 3 c: Trut nulae – T 4 ces and	s- Recurr Non-He stateme - parsing th table of Replace d Boolea	omogen onts – co g trees. of a form ment pr an Alge	lations- soluti eous relations onnectives- ato mula – Tautol ocess- Functio	on of finite order Homogeneo mic and compound statement ogy- Tautological Implication	us (line s-well f s and Ec ctives a	ar) Re ormed quival nd Du	als ar lation 9 l (state 9 ence o ality	$\frac{1}{3} + 3$ ement $\frac{1}{3} + 3$
Recu evalu Solut UNI Logi Form UNI Logi Logi Logi Logi Logi Logi distri	arrence tion of T 2 c: TF- nulae - T 3 c: Trut $nulae -T 4ces andibutive$	s- Recurr Non-He stateme parsing th table of Replace	omogen onts – co g trees. of a form ment pr an Alge	lations- soluti eous relations onnectives- ato mula – Tautol ocess- Functio	on of finite order Homogeneo mic and compound statement ogy- Tautological Implication onally Complete sets of conne	us (line s-well f s and Ec ctives a	ar) Re ormed quival nd Du	als ar lation 9 l (state 9 ence o ality 9 Modul	ad their s- 2 + 3 ement 2 + 3 of aw. 2 + 3 ar and
Recu evalu Solut UNI Logi Form UNI Logi Logi Logi Logi Logi Logi UNI	arrence uations tion of T 2 c: TF- nulae – T 3 c: Trut nulae – T 4 ces and ibutive T 5	s- Recurn Non-He stateme - parsing th table of Replace d Boolea e lattices	onts – co g trees. of a form ment pr an Alge	lations- soluti eous relations onnectives- ato nula – Tautol ocess- Functio bras: Lattices	on of finite order Homogeneo mic and compound statement ogy- Tautological Implication onally Complete sets of conne - some properties of lattices- N	us (line s-well f s and Ec ctives a Jew latt	ar) Re ormed quival nd Du ices- N	als ar lation 9 l (state 9 ence o ality 9 Modul 9	ad their s- p + 3 ement p + 3 of aw. p + 3 ar and $p + 3$
evalu Solut UNI Logi Form UNI Logi Form UNI Latti distri UNI Auto finite	arrence uations tion of T 2 c : TF- nulae – T 3 c: Trut nulae – T 4 ces and ibutive T 5 omata a e autor	s- Recurr Non-He stateme - parsing - parsing d Boolea d Boolea e lattices and Lang mation A	rence re omogen onts – co g trees. of a forn ment pr an Alge guages: Accepta	lations- soluti eous relations onnectives- ato nula – Tautol ocess- Functio bras: Lattices Finite Autom	on of finite order Homogeneo mic and compound statement ogy- Tautological Implication onally Complete sets of conne - some properties of lattices- N hata – definition of finite auto ring by a finite automation -	us (line s-well f s and Ec ctives a New latt	ar) Re ormed quival nd Du ices- N – Rep	als ar lation 9 l (state 9 ence (ality) 9 Modul 9 resent	ad their s- 2 + 3 ement 2 + 3 of aw. 2 + 3 ar and $2 + 3$ ation

1.	"Discrete I the Nation		•			aman, D	Pr.N. Sric	lharan, N	I. Chandi	rasekera
	Unit I :Ch	apter: 5	Sec 1-	5 (Pages	: 5.01- 5.	.19)				
	Unit II	:	Chapte	er: 9	Sec 1- 5	(Pages:	9.1-9.20))		
	Unit III	:	Chapte	er: 9	Sec 6- 10	0 (Pages	: 9.21- 9	.42)		
	Unit IV	:	-	er: 10	Sec 1-4	(Pages:	10.1-10	.32)		
	Unit V	:	Chapte	er: 12	Sec 1 –7	(Pages:	12.1-12	2.16)		
Refere	ence									
1.	Koleman a Delhi- 200	•	- Discret	te Mathe	matical S	Structure	es, Prenti	ce Hall o	of India, N	New
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2. CO 1 CO 2 CO 3 CO 4	https://exp	PO 1 3 3 3 3	es.stanfo PO2 3 3 3 3	rd.edu/se CO PO3 3 3 3 3	earch?q= Ds vs PO PO4 2 2 3 3	CS157[S)s PO5 3 3 3 3	Stanford] PO6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	PO7 1 1 3 2	PO8 1 1 1 1 1	1 1 1
2. CO 1 CO 2 CO 3 CO 4 CO 5	https://exp	PO 1 3	es.stanfo PO2 3 3 3 3 3	rd.edu/se CO PO3 3 3 3 3 3 3	earch?q= Ds vs PO PO4 2 2 3 3 2	CS157[S)s PO5 3 3 3 3 3 3	Stanford] PO6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	PO7 1 1 3 2 1	PO8 1 1 1 1 1 1 1 1 1	1 1 1 1 1
2. CO 1 CO 2 CO 3 CO 4 CO 5 TOTA	https://exp L ED	PO 1 3 15 15 15	es.stanfo PO2 3 3 3 3 15	rd.edu/se CO PO3 3 3 3 3 3 15	earch?q= Ds vs PO PO4 2 2 3 3 2 12	CS157[S)s PO5 3 3 3 3 3 15	Stanford] PO6 1 1 1 1 1 1 5	PO7 1 1 3 2 1 8	PO8 1 1 1 1 1 1 5	1 1 1 1 1 5

Course Name	Numerical methods	L	Т	Р	С
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Co	ourse	Code	XMT503	4	1	0	5		
С	Р	Α		L	Т	Р	Н		
5	0	0		4	1	0	5		
Prer	requisi	ite	Knowledge In Higher Secondary Level Mathema	atics					
On s	On successful completion of this course, the students will be able to:Course OutcomesDomainCO1Identify the solution of numerical algebraic and transcendental equations using appropriate methodsCognitiveCO2Identify the solution of simultaneous linear algebraic equation using Gauss elimination and Gauss Jordan methodCognitiveCO3Construct a function which closely fits given n- points in the plane by using interpolation methodCognitive								
			Course Outcomes	Dom	ain	I	Level		
			•	Cogni	tive	Applying			
CO2	2	equation	on using Gauss elimination and Gauss Jordan	Cogni	tive	Appl	ying		
CO3	3		• • •	Cogni	tive	Appl	ying		
CO4	4	Identi	plane by using interpolation method fy the solution of an equation using the concepts Numerical Differentiation and integration	Cogni	tive	Appl	ying		
COS	5	Analy Equati	zethe solution of anordinary Differential ons using Euler method, modified Euler method inge - Kutta method	Cogni	tive	Analyzing			
UNI	T 1					1	2 + 3		
itera		ethod- (nerical algebraic and Transcendental Equations: T Order of convergence- Regula False method- Newt						
UNI	0					1	2 + 3		
metł		version	neous linear algebraic equation: Gauss elimination of a matrix using Gauss elimination method- Gaus						
UNI	T 3					1	2 + 3		
Inter	rpolatio	on - Gre	gory Newton forward interpolation formula - Back	ward i	nterpo	olation	l		
			ward interpolation formula - Backward interpolati 11a – different forms of Lagrange's interpolation for			Lagra	ange's		
UNI	-					1	2 + 3		
to co	ompute	e derivat	ntiation and integration- Newton's forward and bac ives- the trapezoidal- Romberg's method- Simpson - Weddle's rule.				method		
UNI	-					1	2 + 3		
Tayl	or's se	eries- Pi	n of ordinary Differential Equations-Power series card's method of successive approximations- Eul utta method- orders 2 and 4.						

Text Book			ļ	l		ļ	I		
Unit I	rical Metho c Company : Chapter: 3 : Chapter: 4	Ltd., Ne 3 (3.1.1 t	w Delhi. o 3.4.3),	Pages: 6	9 - 96				inavathy,
Unit III: Unit IV	Chapter: 6 Chapter: 7 Chapter: 7 Chapter: 9 Chapter: 1	5 (6.1-6.6 7 (7.1-7.4 8 (8.7 on 9 (9.1- 9.3	5), Pages 4), Pages 1y), Page 3, 9.6- 9.	: 209 – 2 s: 231 – 2 es: 271 - 15), Page	225, 240, 276. es: 281		145 150		
References		1 (11.1	11.13), 1	uges. 51	0 575				
 S. Sastri Ltd, 201 M.K. Vo (Revised A. Sings 	l2. enkatarama d& Enlarge	n, Nume ed), The I	erical me National	thods in Publishi	science ng Co.,	and Eng Chennai	gineering i, 2004.		_
E-References									
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			•	05 151	US				
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	PO 1 3	PO2 3	1	1	1	PO6 1	PO7	PO8 1	PO9 1
CO 1 CO 2			PO3	PO4	PO5				
	3	3	PO3 3	PO4 2	PO5 3	1	1	1	1
CO 2	3 3	3 3	PO3 3 3	PO4 2 2	PO5 3 3	1 1	1 1	1	1
CO 2 CO 3	3 3 3	3 3 3	PO3 3 3 3	PO4 2 2 2 2 2	PO5 3 3 3 3	1 1 1	1 1 1	1 1 1	1 1 1
CO 2 CO 3 CO 4	3 3 3 3	3 3 3 3	PO3 3 3 3 3 3	PO4 2 2 2 2	PO5 3 3 3 3 3	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1
CO 2 CO 3 CO 4 CO 5	3 3 3 3 3 15	3 3 3 3 3 15	PO3 3 3 3 3 3 15	PO4 2 2 2 2 3 11	PO5 3 3 3 3 3 3 15	1 1 1 1 1 5	1 1 1 1 2 6	1 1 1 1 1 5	1 1 1 1 1 1 5
CO 2 CO 3 CO 4 CO 5 TOTAL	3 3 3 3 3	3 3 3 3 3	PO3 3 3 3 3 3 3 3	PO4 2 2 2 2 2 3	PO5 3 3 3 3 3 3 3	1 1 1 1 1	1 1 1 1 2	1 1 1 1 1	1 1 1 1 1
CO 2 CO 3 CO 4 CO 5 TOTAL SCALED VALUE 0 - No Relation	3 3 3 3 3 15 3 15 3 n, 1 – Low	3 3 3 3 15 3 Relation	PO3 3 3 3 3 3 15 3	PO4 2 2 2 2 3 11 3	PO5 3 3 3 3 3 15 3	1 1 1 1 1 5 1	1 1 1 2 6 2	1 1 1 1 1 5 1	1 1 1 1 1 1 5
CO 2 CO 3 CO 4 CO 5 TOTAL SCALED VALUE 0 - No Relation $1-5 \rightarrow 1, 6-10 -$	3 3 3 3 3 15 3 15 3 n, 1 – Low	3 3 3 3 15 3 Relation	PO3 3 3 3 3 3 15 3 , 2- Mee	PO4 2 2 2 2 3 11 3 Hium Re	PO5 3 3 3 3 3 15 3 elation,	1 1 1 1 1 5 1	1 1 1 2 6 2	1 1 1 1 5 1	1 1 1 1 1 5 1
CO 2 CO 3 CO 4 CO 5 TOTAL SCALED VALUE 0 - No Relation	3 3 3 3 3 15 3 15 3 n, 1 – Low	3 3 3 3 15 3 Relation	PO3 3 3 3 3 3 15 3 , 2- Mec Numb	PO4 2 2 2 2 3 11 3	PO5 3 3 3 3 3 15 3 elation,	1 1 1 1 1 5 1	1 1 1 2 6 2	1 1 1 1 1 5 1	1 1 1 1 1 1 5

С	Р	Α						L	Т	Р	H
5	0	0						4	1	0	5
Prere	quisit	te	Know	edge in Algebr	a				1		
On su	ccess	ful complet	ion of th	is course, the s	tudents w	ill be able to:					
				Course Outco	omes			Do	main	Lev	vel
CO1		Apply the	Euclidea	in algorithm to	compute	the gcd of two int	tegers.	Cog	gnitive	Appl	ying
CO2										Appl	ying
CO3	CO3 Apply the Dirichlet multiplication to Mangold functions.									Appl	ying
CO4		Solve the n	umber t	heoretic proble	ms on ave	rages arithmetic	functions	Cog	gnitive	Appl	ying
CO5		Solve the li	near co	ngruences using	g the conc	epts of congruend	ce	Cog	gnitive	Appl	ying
		relations									
UNIT	1									12 -	+ 3
numb algori	ers - 7 thm -	The fundam	ental the		netic - The	- Divisibility - Gr e series of recipro two numbers.				Euclide	
UNIT	2									12 -	+ 3
relatio	on con	necting and	l - A pro	-	or (n) - th	e mobius functio e Dirichlet produ					n- A
UNIT	1	verses and			Jilliulu.					12 -	+ 3
The M	/ ango	ldt functior	(n) - m	ultiplicative fu	nctions- N	Iultiplicative fund	ction and D	irichle	et multip	licatio	n -
The ir	nverse eralize	of a compl ed convolut	etely m ions - fo	ultiplicative fur ormal power ser	nction - Li ries.	ouville's functior	n A (n) - the	divis	or funct	σ_{a}	, (n)
UNIT	4									12 -	+ 3
	•			0		n Asymptotic equulas - the average	•		s – Eule	r's	
UNIT	5									12 -	+ 3
-				asic properties problems and ex	-	ience's - Residue	classes con	mplet	e residue	e syste	ms -
L	ecture	2	60	Tutorial	15	Practical	0		Total		75
Text	Book			<u> </u>						I	
1.	Ana Uni	•		ry by Tom.M.A 1 (1.1 - 1.8)	Apostal, S	pringer Science &	zBuisness N	/ledia	, 2013.		

Unit II	Chapter 2 (2.1 - 2.7)
Unit III	Chapter 3 $(2.8 - 2.15)$
Unit IV	Chapter 5 (3.1- 3.5)
Unit V	Chapter 9 (5.1- 5.3)

References

- 1. Number Theory, GeorgeE. Andrews, Courier Corporation, 1994.
- 2. Introduction to theory of Number, G.H. Hardy and E.M. Wright, Oxford University Press, 6th edition (2008)..
- 3. Basic Number Theory, S.B. Malilk, Vikas Publishing, 2018.

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PO 1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 CO 1 3 3 3 2 3 1 1 1 CO 2 3 3 3 2 3 1 1 1 CO 2 3 3 3 2 3 1 1 1 CO 3 3 3 3 2 3 1 1 1	
CO 2 3 3 3 2 3 1 1 1 CO 3 3 3 3 2 3 1 1 1	PO9
CO 3 3 3 3 2 3 1 1 1	1
	1
	1
CO 4 3 3 3 2 3 1 1	1
CO 5 3 3 3 2 3 1 1 1	1
TOTAL 15 15 10 15 5 5 5	5
SCALED VALUE 3 3 3 2 3 1 1 1	1

0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation

 $1\text{-}5 \rightarrow 1, 6\text{-}10 \rightarrow 2, 11\text{-}15 \rightarrow 3$

Co	ourse N	Name		G	raph T	heory		L	T	Р	С
Co	ourse (Code			XMT	504		4	1	0	5
С	Р	Α						L	Т	Р	Н
5	0	0						4	1	0	5
Prer	equisi	te	Knov	wledge In Bas	ic Matł	ematics				I	
On s	uccess	ful com	pletior	n of this cours	e, the st	udents will be a	ble to:				
				Course Outco	omes			Dom	ain	L	evel
CO1	L	Expla	in the	basic concept	s graph	s and operation	on	Cogn	itive	Under	standing
		graph									
CO2	2	Demo	nstrat	e the concept	s of wa	ks, trials, paths,	,	Cogn	itive	Under	standing
		conne	ctedne	ss and compo	nents						
CO3	3	Infer	the ch	aracterization	of trees	and centre of a	tree	Cogn	itive	Under	standing
CO4	1	Outlin	ne the	basics of mate	chings a	nd planarity		Cogn	itive	Under	standing
CO5	5	Relate	e the fo	our colour the	orem ai	nd five colour		Cogn	itive	Under	standing
		theore	m								
UNI	T 1	Grap	hs and	Subgraphs			ļ			12	2 + 3
	and co	verings	– Inter	0	s and li	Isomorphism, F ne graphs – mat dness	•			on gra	
Degr	ree seq	uences a	and gra	aphic sequenc	es – Wa	alks, trials and p	oaths – co	onnec	tednes	ss and	
comp	ponent	s – Bloc	ks and	l connectivity							
UNI				d Hamiltonia							k + 3
Euler UNI		1		n Graphs – Tro and Planarity		aracterization o	f trees –	centre	e of a		2+3
			U	·		lanarity – Defin	ition – c	haraci	erizat		
	U		U	sing and outer	•	•		inarae	ion Zai	1011 01 1	Junu
UNI'			,	U	Prunui	~;				12	k + 3
				-	- Five c	olour theorem -	- Four c	olour	proble		
	nomia			mach	11,00		1 001 0	51041	riven		
•	ecture		60	Tutorial	15	Practical	0		Tota	al	75
							Ú Ú		_ 00		
Text	t Book										

1. An invitation to Graph theory - Dr. S. Arumugam& S. Ramachandran, SCITEC publications (India) P. Pvt.Ltd., Chennai, 2006.

1	· · · ·	,
Unit I	:	Chapter 2
Unit II	:	Chapter 3 and 4
Unit III	:	Chapter 5 and 6
Unit IV	:	Chapter7 and 8
Unit V	:	Chapter 9

References

1. Graphs Theory with Applications to Engineering and computer science – NarsinghDeo, Printice- Hall of

India Private Ltd, 2014.

- 2. Graph Theory- F. Harary, Narosa Publishing House, edition 2013.
- 3. S.A. Choudham, A First Course in Graph Theory, Macmillan India Ltd, 1987.

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			(COs vs P	Os				
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	3	1	0	1	1
CO 2	3	3	2	1	3	1	0	1	1
CO 3	3	3	2	1	3	1	0	1	1
CO 4	3	3	2	1	3	1	0	1	1
CO 5	3	3	2	1	3	1	0	1	1
TOTAL	15	15	10	5	15	5	0	5	5
SCALED	3	3	2	1	3	1	0	1	1
VALUE									
0 - No Relation, 1	l – Low	Relation	, 2- Med	lium Re	lation, 3	3- High	Relation	1	
$1-5 \rightarrow 1, 6-10 \rightarrow 2$	2, 11-15-	→ 3							

Co	ourse N	Name	Mathematical Modeling	L	Т	Р	С
Co	ourse	Code	XMT504	4	1	0	5
С	Р	Α		L	Т	Р	Н
5	0	0		4	1	0	5
Prer	equisi	te	Basic knowledge of algebra, differentiation conce	epts.			
On s	uccess	ful com	pletion of this course, the students will be able to:				
			Course Outcomes	Dom	ain	Le	evel
CO1	l	-	in the c lassification of mathematical models and tions of mathematical modelling	Cogn	itive	Unders	standing
CO2	2	Apply equati	the concepts offirstorderordinary differential ons to form mathematical modeling for Dynamic eometrical problems	Cogn	itive	Applyi	ng
CO3	3	•	ze the mathematical models involved in mics through first order ordinary differential ons	Cogn	itive	Analyz	ving
CO4	ļ	Race,	ze the mathematical models in Medicine, Arms Battles and International Trade in terms of ns of ordinary differential equations	Cogn	itive	Analyz	zing
CO5	5	•	ze the models in Planetary motions, Circular	Cogn	itive	Analyz	zing
	T 4	motio	n and motion of Satellites			10	•
UNI							+ 3
			quiring Mathematical modeling and technique-Cla				
			cteristics of mathematical models-Modeling throu	-	-		-
		cal mod	lodeling through Trigonometry-Modeling through	Calcul	us-Liii	птаноп	5 01
UNI			enng.			12	+ 3
Math	nemati	cal Mod	eling through differential Equations-Linear Growt	h and I)ecav]	Models	-Non-
			Decay Models-Compartment Models-Modeling in		-		
			al equations of first order- Mathematical modeling				olems
throu	ugh oro	linary d	ifferential equations of first order.				
UNI	Т3					12	+ 3
Ordin diffe	nary d rential	ifferenti equatio	eling in Population Dynamics-Modeling of Epider al equations of first order-Compartment models th ns-Modeling in Economics through systems of ord	rough s	system	s of or	linary
or m	rst ord	U .					

Mathematical models in Medicine, Arms Race, Battles and International Trade in terms of systems of ordinary differential equations-Modeling in Dynamics through systems of Ordinary Differential equations of first order.

UNIT 5

12 + 3

Mathematical modeling of Planetary motions – Modeling of Circular motion and motion of Satellites.

Lecture	60	Tutorial	15	Practical	0	Total	75
Text book							

1. "Mathematical Modeling' by J.N. Kapur, New Age International Private Limited, Second edition, 2021.

Unit I	:	Chapter 1.1-1.9
Unit II	:	Chapter 2.1-2.6
Unit III	:	Chapter 3.1-3.4
Unit IV	:	Chapter 3.5-3.6
Unit V	:	Chapter 4.1-4.2

References

1." An Introduction to Mathematical Modeling "byEdward A. Bender, Dover publications (2003)

E-References

http://nptel.ac.in

			C	COs vs P	Os				
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	3	1	0	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	2	1	3	1	0	1	1
CO 4	3	3	3	3	3	1	2	1	1
CO 5	3	3	3	3	3	1	2	1	1
TOTAL	15	15	14	12	15	5	7	5	5
SCALED VALUE	3	3	3	3	3	1	2	1	1
0 - No Relation,	1 – Low	Relation	, 2- Med	lium Re	lation, 3	3- High I	Relation		

$1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$

Co	ourse	Name	Fundamentals of Data Science & R Programming	L	Т	Р	С	
Co	ourse	Code	XMT505	1	1	0	1	
С	P	Α		L	Т	Р	Н	
1	0	0		1	1	0	2	
Prer	equi	site	Basic computer knowledge	I	I			
On s	ucce	ssful com	pletion of this course, the students will be able to:					
			Course Outcomes	Dom	ain	Le	evel	
COI	L		ibe the significance of data science and stand the Data Science process	Cogn	itive	Unders	standing	
CO2	2		, and prepare data for use with a variety of ical methods and models	Cogn	itive	Applyi	ng	
CO3	3	Analy	ze Data using various Visualization techniques.	Cogn	itive	Analyz	zing	
CO4	ł	-	ze the variables, scalars, vectors in R amming.	Cogn	itive	Analyzing		
COS	5	Apply	the various charts and plots.	Cogn	itive	Applyi	ng	
UNI	T 1					12	+ 3	
UNI	T 2	Science Data S Popul Assur The D Data I Collece Ranki Norm Analy	uction To Data Science: Definition, Big Data and E ce Hype, Datafication, Data Science Profile, Meta- Scientist, Statistical Inference, Populations and Sar ations and Samples of Big Data, Big Data Can Mea options, Modeling, Philosophy of Exploratory Data vata Science Process, A Data Scientist's Role in thi Munging: Properties of Data, Languages for Data Sc eting Data, Cleaning Data, Crowdsourcing. Scores ngs: Developing Scoring Systems, Z-scores and alization, Advanced Ranking Techniques Statistica sis: Sampling from Distributions, Statistical Distri tical Significance, Permutation Tests and P-values	Definit nples, an Big a Analy s Proce Science and	vsis, ess	12	+ 3	

UNIT 3									12 + 3
	Introduction t Scalars, Vecto Rbind, attach	ors. Matrie	ces, Lis	t, Data f	rames, U	Jsing c, (R,	
UNIT 4									12 + 3
	Importing dat SAS, accessir writing to file selecting colu names	ng databas s Manipul	e, Savii lating D	ng in R c Data, sele	lata, Loa ecting ro	ding R ws/obset	data obj rvations	ects,	
UNIT 5									12 + 3
	R Programmi operations Ch Pie graph, Lir	arts and P	Plots, B	ox plot, l				s,	
Lecture	60	Tutoria	l 15	5 Pr	actical		0	Total	75
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CO 3	3	3	2	1	3	1	0	1	1
CO 4	3	3	2	1	3	1	0	1	1
CO 5	3	3	3	2	3	1	1	1	1
TOTAL	15	15	12	7	15	5	2	5	5
SCALED									
Dentee	•	•	•	•	•				
VALUE	3	3	3	2	3	1	1	1	1
								1	1

Co	ourse N	Name	Quantitative Aptitude -IV	L	Т	P	С
C	ourse	Code	XMT506	2	0	0	2
С	Р	Α		L	Т	Р	Η
2	0	0		2	0	0	2
Prer	equisi	te	Basic mathematical knowledge	1 1	1 1		
On s	uccess	ful comp	letion of this course, the students will be able to:				
			Course Outcomes	Dom	ain	Le	evel
CO1	l	-	n the basic concepts of Probability and True ntand to solve problems	Cogni	tive	Apply	ving
CO2	2	-	n the basic concepts of Banker's Discount, s & Distances and solve problems	Cogni	tive	Apply	ving
CO3	;	-	n the basic concepts of odd man Out, Series and s, Tabulation and to solve the problems	Cogni	tive	Apply	ving
CO4	ŀ	-	n the basic concepts of Bar Graphs Pie Charts and e the problems	Cogni	tive	Apply	ving
CO5	5	Explai the Pro	n the basic concepts of Line Graphs and to solve blems	Cogni	tive	Apply	ving
UNI	T 1			1			6
Prob	ability	, True Di	scount.				
UNI	T 2						6

UNIT 3									6
Odd man Out, U NIT 4	Series and P	atterns, T	abulatio	n.					6
Bar Graphs Pie	e Charts								
UNIT 5									15
Line Graphs.									
Lecture	30	Tutoria	al 0	Pr	actical		0	Total	30
Text Book	ļ			Ι					
	ggarwal, Qua (2013)	antitative	Aptitude	e for Con	npetitive	e Examin	ations, S	Chand;	20th
2. UGC-CSIR		n (2014). y Dr. Paw	an Sharı	na and A	Anshuma	ın, Ariha	nt Public	ation.	
2. UGC-CSIR 3. Fast Track (E-References 1. www.career 2. www.jagran	econd edition NET/SET by Objective Ari bless.com ijosh.com	n (2014). y Dr. Paw	an Sharı	na and A	Anshuma	ın, Ariha	nt Public	ation.	
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2. UGC-CSIR 3. Fast Track (E-References 1. www.career 2. www.jagran	econd edition NET/SET by Objective Ari bless.com ijosh.com	n (2014). y Dr. Paw	an Sharı oy Rajesh	na and A 1 Verma,	Anshuma Arihant	ın, Ariha	nt Public	ation.	
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2. UGC-CSIR 3. Fast Track (E-References 1. www.career 2. www.jagran 3. www.bestgu	econd edition NET/SET by Objective Ari bless.com ijosh.com iru.com	n (2014). y Dr. Paw thmetic b	yan Sharr by Rajesh CO PO3	na and A n Verma, Os vs PC PO4	Anshuma Arihant Os PO5	n, Ariha Publicat	nt Public tion, Edi	ation. tion 2012	2. PO9
2. UGC-CSIR 3. Fast Track (E-References 1. www.career 2. www.jagran 3. www.bestgu CO 1 CO 2	econd edition NET/SET by Dbjective Ari bless.com ijosh.com iru.com PO 1 3	PO2	yan Shari by Rajesh CO PO3 3	na and A n Verma, Ds vs PC PO4 2	Anshuma Arihant Os PO5 3	n, Ariha Publicat PO6	nt Public tion, Edi PO7 1	ation. tion 2012 PO8 1	2. PO9 1
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SEMESTER VI

Course CodeXMT6013104CPALTPH40003205PrerequisiteKnowledge in CalculusOn successful completion of this course, the students will be able to:Course OutcomesDomainLevelCO1Determine whether the given function is Continuous / differentiable / analytic.CognitiveEvaluating bilinear transformationCO2Determine the image of given region under the given bilinear transformationCognitiveEvaluating cognitiveCO3ExplainCauchy's theorem and Cauchy Integral function using the concepts of series expansionCognitiveEvaluating function using the concepts of series expansionCO4Determine the annulus of convergence of a given function using the concepts of series expansionCognitiveEvaluating function using the concepts of series expansionCO5Evaluate complex numbers9 + 3Complex numbers – Functions of a complex variable – Limits – Theorems on limit – Continuo functions (Except Milne-Thompson method).UNIT 2Bilinear transformation9 + 3Introduction – Elementary transformations – Bilinear transformationsUNIT 3Complex IntegrationOr elauchy's Theorem – Cauchy's integral formula – Maximum modulus theorem – Higher derivatives – Cauchy's integral formula – Maximum modulus theorem – Higher derivatives – Cauchy's integral formula – Maximu	Co	ourse N	lame		Con	nplex A	nalysis		L	Т	P	С
4 0 0 3 2 0 5 Prerequisite Knowledge in Calculus Image: Color State of the state	Co	ourse (Code			XMT	501		3	1	0	4
Prerequisite Knowledge in Calculus On successful completion of this course, the students will be able to: Course Outcomes Domain Level CO1 Determine whether the given function is Continuous / differentiable / analytic. Cognitive Evaluating CO2 Determine the image of given region under the given bilinear transformation Cognitive Evaluating CO3 Explain Cauchy's theorem and Cauchy Integral Cognitive Evaluating CO4 Determine the annulus of convergence of a given function using the concepts of series expansion Cognitive Evaluating function using the concepts of series expansion CO5 Evaluate complex numbers 9 + 3 Complex numbers 9 + 3 Complex numbers – Functions of a complex variable – Limits – Theorems on limit – Continuou functions (Except Milne-Thompson method). Y + 3 UNIT 2 Bilinear Transformation 9 + 3 Introduction – Elementary transformations – Bilinear transformation – cross ratio – fixed point of bilinear transformation 9 + 3 Introduction – definite integral – Cauchy's Theorem – Cauchy's integral formula – Maximum modulus theorem – Higher derivatives – Cauchy's integral formula – Maximum modulus theorem – Higher derivatives – Cauchy's intequality – Liouville's theorem – Fundamental theorem of algebra – Morera's theorem. 9 + 3	C	Р	Α						L	Т	Р	Н
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definite integral –Contour integration types.												
			-			-	ment theorem -	– Rouch	e's the	orem -	Evalu	ation o
			<u> </u>				Practical	0		Total		60

1. "Complex Analysis" by S. Arumugam, A. Thangapandi Isaac, A. Somasundaram, Scitech Publications, 2014.

Unit I	:	Chapter 1 (Sec: 1.1), Pages: 1 – 2
		Chapter 2 (Sec: 2.1 – 2.8), Pages: 24 – 52
Unit II	:	Chapter 3 (Sec: 3.1 – 3.5), Pages: 74 – 100
Unit III	:	Chapter 6(Sec: 6.1 – 6.4), Pages: 132 – 170
Unit IV	:	Chapter 7(Sec: 7.1 – 7.4), Pages: 173 – 207
Unit V	:	Chapter 8(Sec: 8.1 – 8.3), Pages: 209 – 254

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- 2. "Functions of a complex variables with applications" by E.G. Phillis (1968)- Oliver & Boy D, Edinburg

E-References

http//nptel.ac.in	1								
			C	COs vs P	Os				
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	1	3	1	1
CO 2	3	3	3	3	3	1	3	1	1
CO 3	3	3	2	1	3	1	0	1	1
CO 4	3	3	3	3	3	1	3	1	1
CO 5	3	3	3	3	3	1	3	1	1
TOTAL	15	15	14	13	15	5	12	5	5
SCALED	3	3	3	3	3	1	3	1	1
VALUE									
0 - No Relation	n, 1 – Low	Relation	, 2- Med	lium Re	lation, 3	3- High	Relation	. L	
$1-5 \rightarrow 1, 6-10$	→ 2, 11-15 -	→3							

~	uise i	Name		Oper	ations Research	L	Т	P	С
Co	ourse	Code			XMT602	3	1	0	4
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4	0	0				3	1	0	4
Prer	equis	ite	Know	ledge In Basi	ic Mathematical Concepts	I			
On s	uccess	sful con	pletion	of this course	, the students will be able to:				
			(Course Outco	omes	Dom	ain	L	evel
CO1		Apply program	graphi mming p		to solve a given linear	Cogn	itive	Apply	ying
CO2		method	and big	g M method	ing problem using simplex	Cogn		Apply	
CO3 CO4		Deterr	nine th		ven project using PERT solution for Transportation roblems	Cogn Cogn		Apply Apply	
CO5		Utilize	domina	U U	for finding saddle point of the	Cogn	itive	Apply	
UNI	T 1							9	+ 3
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Text Book

1. Problems in operations Research, P.K Gupta & Man Mohan, Sultan Chand & Sons.

Unit I	:	Chapters 0 to 3
Unit II	:	Chapters 4, 5,6,8,9

- Unit III : Chapters 9 and 27
- Unit IV : Chapters 15 and 16
- Unit V : Chapters 20

Reference

1." Operations Research" Kanti Swarup, PK. Gupta and Man Mohan, Sultan Chand and Sons, edition 2020.

E-References

http//nptel.ac.in

			CO	Os vs PC	s				
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	3	1	1	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	3	2	3	1	1	1	1
CO 4	3	3	3	2	3	1	1	1	1
CO 5	3	3	3	2	3	1	1	1	1
TOTAL	15	15	15	10	15	5	5	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1
0 - No Relation, 1	-Low F	Relation,	2- Medi	um Rela	tion, 3-	High Ro	elation		
$1-5 \rightarrow 1, 6-10 \rightarrow 2$, 11-15 —	→ 3							

Co	urse N	Name	Fuzzy Sets and its Applications	L	Т	P	С
Со	ourse	Code	ХМТ603	4	1	0	5
С	Р	Α		L	Т	P	Н
5	0	0		4	1	0	5
Prei	requis	site				I	
On s	succes	sful co	mpletion of this course, the students will be able to:				
			Course Outcomes	Dom	ain	L	evel
		Defin	e the Fuzzy sets, Fuzzy graphs and their	Cogni	tive	Under	standing
CO 1	1	princi	ples.				
CO2	2	Unde	rstandFuzzy relations and Fuzzy graphs.	Cogni	tive	Analyz	zing
CO.	3	Analy	zeFuzzy quantifiers and Multi conditional	Cogni	tive	Analyz	zing
00.	0	appro	ximate reasoning				
		Expla	in the Fuzzification. Defuzzification and the	Cogni	tive	Under	standing
CO4	4	variou	s Defuzzification methods				
		Apply	y the Fuzzy ranking methods in Civil Engineering,	Cogni	tive	Apply	ng
CO	5	Mech	anical Engineering, Industrial Engineering and				
		Media	cine				
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Fuzz	zy rela	tions a	nd fuzzy sets – Composition of Fuzzy relations – M	in-max	comp	osition	and its
			y graphs – Special fuzzy relation - Possibility Theor	ry – Pos	sibili	ty of fu	zzy
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UNIT 5 Dec	ision ma	king in F	uzzy Env	vironme	nt				12+3
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Medicine. LECTURE	60	TUTOR	IAL 15	5 PRA	CTICA	L	0	TOTAL	75
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L. <u>http://www.te</u> yllabus_2013.j 2. <u>http://www.in dmissions/env</u>	odf[Camb mperial.a ironmenta	n/dmaths oridge Un c.uk/civil- al-engined PO2	/program iversity] -engineer ering-clus (PO3	me/PhD ing/pros ster/sylla COs vs P PO4	-MathSc pective-s bus/cive Os PO5	students/ 97035/[1 PO6	PO7	College	London] PO9
1. <u>http://www.te</u> syllabus_2013.j 2. <u>http://www.in</u> admissions/env CO 1 CO 2	pdf[Camb mperial.a ironmenta PO 1 3	n/dmaths oridge Un c.uk/civil al-engined PO2 3	/program iversity] -engineer ering-clus (PO3 2	me/PhD ing/pros ster/sylla COs vs P PO4 1	-MathSc pective-s bus/cive Os PO5 3	students/ 97035/[1 PO6 1	mperia PO7 0	PO8	London] PO9 1
E-References 1. <u>http://www.te</u> syllabus_2013.j 2. <u>http://www.in</u> admissions/env CO 1 CO 2 CO 3 CO 4	PO1 PO1 3 3	n/dmaths pridge Un c.uk/civil al-engined PO2 3 3	/program iversity] -engineer ering-clus PO3 2 3	me/PhD ing/pros ster/sylla COs vs F PO4 1 3	-MathSc pective-s bus/cive Os PO5 3 3	students/ 97035/[1 PO6 1 1	PO7 0 2	PO8 1 1 1	London] PO9 1 1
1. <u>http://www.te</u> syllabus_2013.j 2. <u>http://www.in</u> admissions/env CO 1 CO 2 CO 3 CO 4	PO 1 PO 1 3 3 3	n/dmaths pridge Un c.uk/civil al-engined PO2 3 3 3 3	/program iversity] -engineer ering-clus PO3 2 3 3	me/PhD ing/pros ster/sylla COs vs F PO4 1 3 3	-MathSc pective-s bus/cive POs PO5 3 3 3 3	students/ 97035/[1 PO6 1 1 1	PO7 0 2 2	PO8 1 1 1 1	London] PO9 1 1 1 1 1
1. <u>http://www.te</u> syllabus_2013.j 2. <u>http://www.in</u> admissions/env CO 1 CO 2 CO 3	PO 1 PO 1 3 3 3 3 3	PO2 3 3 3 3 3	/program iversity] -engineer ering-clus PO3 2 3 3 2	me/PhD ing/pros ster/sylla COs vs P PO4 1 3 1	-MathSc pective-s bus/cive POs PO5 3 3 3 3 3	students/ 97035/[1 PO6 1 1 1 1	PO7 0 2 2 0	PO8 1 1 1 1 1 1 1	London] PO9 1 1 1 1 1 1

Co	ourse	Name	Introduction to Industry 4.0	L	Т	P	С	
Co	ourse	Code	XMT603	4	1	0	5	
С	Р	Α		L	Т	Р	Н	
5	0	0		4	1	0	5	
Prer	equis	ite			I		I	
On s	ucces	sful com	pletion of this course, the students will be able to:					
			Course Outcomes	Dom	ain	L	evel	
CO1	L	Know t	he reason for adopting Industry 4.0 and Artificial	Cogn	itive F	Remer	nbering	
		Intellige	ence.					
CO2	2	Unders	tand the need for digital transformation.	Cogn	itive U	Jnder	standing	
CO3	3	Apply t	he industry 4.0 tools.	Cogn	itive A	Apply	ing	
CO4	ŀ	Analyz	e the applications of Big Data.	Cogn	itive A	Analyz	zing	
CO5	5	Examir	e the applications and security of IoT	Cogn	itive A	Analyzing		
		Applica	tions					
UNI	T 1	Industr	ry 4.0			12	2+3	
Tech	nolog	gies of In	Adopting Industry 4.0 - Definition – Goals and Dedustry 4.0 – Big Data – Artificial Intelligence (AI) Purity – Cloud – Augmented Reality.	<u> </u>	-		t of	
UNI	-	-	al Intelligence			12	2+3	
of A	I -The	e AI -env	ce: Artificial Intelligence (AI) – What & Why? - H ironment - Societal Influences of AI - Application logies of AI - Future Prospects of AI - Challenges	Domai	ns and			
UNI	T 3	Big Dat	ta and IoT			12	2+3	
of Bi Char Big I Lear Indu (IoT)	ig Dat cacteri Data I ning - stry -) : Intr licatic	a in Indu stics - Bi Domain S Big Dat Big Data roductior ns - App	on - Data Evolution - Data : Terminologies - Big D Istry 4.0 - Big Data Merits and Advantages - Big D g Data Processing Frameworks - Big Data Applica Stack : Big Data in Data Science - Big Data in IoT a in Databases - Big Data Use cases Big Data in So Roles and Skills -Big Data Roles - Learning Platf a to IoT - Architecture of IoT - Technologies for Io lications of IoT - Security in IoT . ations And Tools Of Industry 4.0	Oata Co ations - - Big I ocial C orms; J	mponer Big Da Data in I auses - Internet	nts : E ata To Machi Big D of Th g IoT	big Data ols - ne Data for	

Applications of			U				1		
Agriculture – T	_		-	_		-			
Business, Gove		*			Intellige	nce, Big	Data an	d Data Ar	alytics,
Virtual Reality, UNIT 5 Jobs	Augmente s 2030	a Reality	, 101, K	obotics.					12+3
Industry 4.0 – H		10 - Cm	riculum	$\frac{10 - F_{2}}{10}$	eulty A	0 _ Skill	s require	ad for Fut	
for Education ·							-		
Education with			,•••••				· · · · ·		
Lecture	60	Tutori	al 15	5 Pr	actical	(0	Total	75
Text Book									
1. Higher I	Education f	for Indus	try 4.0 a	nd Trans	formatio	on to Edu	ucation 5	5.0(2020)-	Р.
Kaliraj&	z T. Devi		5						
References	Λ Ω" 1 T			(D.,1-1) 1	TT7'1		(2010)		
1." Industry	4.0^{-7} , by Je	ean-Clau	de Andre	e, Publis	ner: Wil	ey-ISTE	(2019)		
E-References									
https://nptel.ac.	in/courses/	106/105/	1061051	95/					
			(COs vs P	Os				
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	1	0	3	1	0	1	1
CO 2	3	3	2	1	3	1	0	1	1
CO 3	3	3	3	2	3	1	1	1	1
CO 4	3	3	3	3	3	1	2	1	1
CO 5	3	3	3	3	3	1	2	1	1
TOTAL	15	15	12	9	15	5	5	5	5
SCALED	3	3	3	2	3	1	1	1	1
VALUE	5	5	5	4	3	L			I
0 - No Relation	, 1 – Low	Relation	, 2- Meo	lium Re	lation, 3	3- High	Relation		

Co	ourse l	Name			Astron	omy			L	T]	P	С
Co	ourse	Code			XMT	604			4	1	(0	5
С	Р	Α							L	Τ]	P	Н
5	0	0							4	1	(0	5
Prer	equisi	te	Knov	vledge In Ph	ysics a	nd Mathen	natics	5	I	I	I	I	
On s	success	ful com	pletion	of this cours	e, the st	tudents will	be a	ble to:					
			C	Course Outco	omes				Dom	nain		Le	vel
COI	l	Expla	in the o	celestial sphe	ere and i	ts moveme	nt.		Cogn	itive	Und	lers	tanding
CO2	2	Demo	onstrate	e the radius o	f earth	and rotation	n of e	arth	Cogn	itive	Und	lers	tanding
CO3	3	Infert	he pher	nomenon of t	wilight	and refract	ion.		Cogn	itive	Und	lers	tanding
CO4	4	Apply Kepler's third law to construct explanations about planetary systemsCognitiveInterpret the equation of time, seasons and calendarCognitive			itive	Applying							
COS	5		-		time, s	easons and	calen	ıdar	Cogn	itive	Understanding		
UNI	T 1											12	+ 3
		ohere – l	Diurnal	motion						1			
UNI	T 2											12	+ 3
The	Earth	: Zones	of Eart	h – Terrestria	al latitu	des and lon	gitud	es – Ra	dius o	f earth	n - R	otat	tion of
earth	n – Dip	of horiz	zon										
UNI	T 3											12	+ 3
Twil	light –	 Refracti	ion										
UNI												12	+ 3
Kep	ler's L	aws											
UNI	Т 5											12	+ 3
Tim	e: Equ	ation of	time –	seasons – ca	lendar								
Le	ecture		60	Tutorial	15	Practic	al	0		Tot	al		75
Text	t Book						1						
1	I. "As	stronom	y" by S	. Kumaravel	u and S	usheelaKur	narav	velu, Ag	gasthiy	ar Pu	blicat	tion	, 2013.
	Uni	t	:	Chapter	II, Artic	cle 39 – 79							
	Uni		:	-		: 3.1 – 3.5),							
		t III	:			3.6), Chapt		, Artic	le 111	- 134			
		t IV	:	-		icle 146 – 1							
D °	Uni		:	Chapter	VII, Ar	ticle 166 –	179						
Kete	erence	5											

1 "Astronomy" by G.V. Ramachandran. Mission Press, Palayamkottai, 1965

2. Textbook on Astronomy H. SubramaniAiyar, Publisher : National Book Trust (1970)

E-References

- <u>http://bulletin.columbia.edu/columbia-college/departments-</u> instruction/astronomy/#coursestext [Columbia_University]
- <u>Https://Www.Physics.Utoronto.Ca/~Jharlow/Teaching/Astron03/Fullnotes/</u> [University Of Toronto]

	-		(COs vs P	Os				
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	3	1	0	1	1
CO 2	3	3	2	1	3	1	0	1	1
CO 3	3	3	2	1	3	1	0	1	1
CO 4	3	3	3	2	3	1	1	1	1
CO 5	3	3	2	1	3	1	0	1	1
TOTAL	15	15	11	7	15	5	1	5	5
SCALED	3	3	3	2	3	1	1	1	1
VALUE		-				_			_
0 - No Relation, 1	- Low	Relation	, 2- Med	lium Re	lation, 3	3- High]	Relation	1	
$1-5 \rightarrow 1, 6-10 \rightarrow 2$	2, 11-15 -	→ 3							

Co	ourse N	Name		Stoc	hastic F	rocesses		L	T		P	С
Co	ourse	Code			XMT	504		4	1		0	5
С	Р	А						L	Т		P	Н
5	0	0						4	1		0	5
Prer	requisi	te		knowledge i tional expect	-	bility theory a	and linear	algebi	a incl	udin	g	
On s	success	ful com	pletion	of this course	e, the st	udents will be	e able to:					
			C	ourse Outco	omes			Don	nain		Le	vel
COI	L		in the		n of st	ochastic proc	ess and	Cogn	itive	Uno	ders	tanding
CO2	2	absorp	otion tir	ne for Marko	v chain	and expected s using the pr	inciple	Cogn	itive	Арј	olyi	ng
CO3	3			ng with respe the concepts		h and death p	rocesses	Cogn	itive	Uno	ders	tanding
CO4	1	Summ	narize	he concepts	of renev	val process		Cogn	itive	Uno	ders	tanding
COS	5	Infer martir		cepts of supe	r martii	ngales and sub)	Cogn	itive	Uno	Understanding	
UNI	T 1		0					I			12	+ 3
gene Tran	eral Ste sition n-Recu	ochastic	proces	sses – Marko	v Chair	examples of S ns- Definition chain - cla	ns – Exan	iples of	of Ma	ırkov	Cl Ma	nain-
		imit the	0.0000 01	Montroy abo	incord	annlightions	Diagnata		1	tion		
						applications- recurrence-			-	uion	-pro	01 01
UNI			1				1	0	1		12	+ 3
proc	esses-1 erentia	nore ab	out Po	isson proces	ses- A	v chains-Gene counter mod ocesses-Exan	el-birth a	nd de	ath p	roces	ses pro	-
Rene	ewal F nentary	rocesse	s – Moi	e on some	special	cess and rela Renewal pro I Theorem –	ocesses –	Renew	val eq	uatio	ons the	and
	-		•		ind exai	mples – Supe	r marting	gales a	and S	ub n	narti	ingales-
	-	nal sam			1.5			Ι	TE é		1	.
Le	ecture		60	Tutorial	15	Practical	0		Tot	al		75

Text Book									
	t course in				- Secon	d Editio	on by S	Samuel	karlin an
•	lor, Acaden			rork.					
	: Chapter : Chapter								
	I : Chapter								
	/ : Chapter	•	,						
	: Chapter		,						
References									
1. "Stochastic		S.K. Sr	inivasan	and K.I	M. Meh	ata, Tata	aMcGrav	v - Hill	Publishin
Company Ltd.									
New Delhi		A.1.1: 0	1 T	1:4: 117	::1		N D	- 11- 1	
2. "Stochastic		viendi, S	econd E	ution w	ney Eas	tern Ltd	., New D	eini.	
E-References									
http//nptel.co.i	in								
1 1			(COs vs P	Os				
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	3	1	0	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	2	1	3	1	0	1	1
CO 4	3	3	2	1	3	1	0	1	1
CO 5	3	3	2	1	3	1	0	1	1
TOTAL	15	15	11	6	15	5	1	5	5
SCALED	3	3	3	2	3	1	1	1	1
VALUE					-	-			-
0 - No Relatio									

Co	urse l	Name	Cyber Security	L	Т	Р	С			
Co	ourse	Code	XUM005	1	0	0	1			
С	Р	Α		L	Т	SS	Н			
1	0	0		1	0	1	2			
Prer	equis	ite	Basic Programming knowledge and technical ski	lls.	I	1 1				
On s	ucces	sful com	pletion of this course, the students will be able	to:						
			Course Outcomes	Dom	ain	L	evel			
CO 1	1	Unders technolo	tand the fundamentals of Cyber Security and the ogies.	Cogn	itive	Understanding				
CO 2	2	Unders security	tand the organizational structure of Cyber	Cogn	itive	Unders	standing			
CO S	3	Unders	tand the Cyber Security policy development	Cogn	itive	Unders	standing			
CO 4	4	Unders	tand the Indian IT act and the initiatives	Cogn	itive	Unders	standing			
CO S	5	Unders	tand and Apply the Cyber security practices	Cogn	itive	Apply	ng			
UNI	T 1	INTRO	DUCTION				3			
Regu Strate Cour UNI	ilation egy V nter M T 2	is – En Versus Po Leasures CYBEI	Cyber Security policy – Domain of Cyber Security Policy – Technology Operations – Technology – Cyber Security Evolution – Productivity – Challenges R SECURITY OBJECTIVES AND GUIDANC	echnolo – Inter E	ogy C met –	onfigu E com	ration – merce – 3			
Fram Secu Proje The	neworl rity P ect– C Catalo	ks – E C olicy Ot Cyber Se og Appro	etrics – Security Management Goals – Counting ommerce Systems – Industrial Control Systems – ojectives – Guidance for Decision Makers – Tor curity Management – Arriving at Goals – Cyber ach – Catalog Format – Cyber Security Policy Tax R SECURITY POLICY CATALOG	Person ne at the Secur	nal Mo ne Top rity Do	obile D	evices – icy as a tation –			
UNIT 3CYBER SECURITY POLICY CATALOG3Cyber Governance Issues – Net Neutrality – Internet Names and Numbers – Copyright and Trademarks – Email and Messaging – Cyber User Issues – Malvertising – Impersonation – Appropriate Use – Cyber Crime – Geo location – Privacy – Cyber Conflict Issues – Intellectual property Theft – Cyber Espionage – Cyber Sabotage – Cyber Welfare– Computer Forensics – SteganographyUNIT 4CYBER SECURITY INITIATIVES AND IT ACT3										
Counter Cyber Security Initiatives in India, Cyber Security Exercise, Cyber Security Incident Handling, Cyber Security Assurance, IT Act, Hackers–Attacker–Counter measures ,Web Application Security, Digital Infrastructure Security ,Defensive Programming. Traditional										

		RACTIO							3			
Guidelines t		web			•							
security ,Gui		-	÷	-			÷					
Manager ,Wi–	•	,Guidelin	nes for s	ocial me	edia secu	rity ,Tip	os and be	est practic	ces for safe			
Social Networ Basic Security	e	lowe He	or Acc	ount Do	aword	Introduc	tion to	mobila	Smortphon			
Security, An									-			
Security ,Secu	urity of Del	bit and C	Credit C	ard ,Ul	PI Secu	rity Se	curity of					
wallet Security Lecture	y Guidelines 15	Securi Tutoria			r Point o actical		POS <mark>)</mark>)	Total	15			
	15	1 01011		F I	actical		J	Total	15			
Text Books												
1. Jennifer L	•			•		,	rey Schn	nidt, Josej	ph Weiss			
"Cyber Sec	curity Policy	Guidebo	ook" Joh	n Wiley	& Sons	2012.		-				
2. Rick How							ns 2011.					
3. Cyber La	aws & Infor	mation 7	Fechnolo	ogy, Jotł	ni Ratha	n, Vijay	Rathan,	Bhrath P	ubishers,7			
Edition Ja	nuary 2019.											
References												
1 1 1 0	1		1 D	1 4 1	-	PR Pub	lications	2020				
 Modern Cyber security Practices by Pascal Ackerman, BPB Publications,2020 Dan Shoemaker Cyber security The Essential Body Of Knowledge, 1st ed. Cengage 												
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2. Dan Shoer	maker Cyber								ge			
	naker Cyber 2011	r security	The Ess	sential B	ody Of	Knowled	lge, 1st e	ed. Cenga				
 2. Dan Shoer Learning 2 3. Rhodes-C 	naker Cyber 2011	r security	The Ess	sential B	ody Of	Knowled	lge, 1st e	ed. Cenga				
 Dan Shoer Learning 2 Rhodes-C McGraw- 	naker Cyber 2011 Jusley, Marl Hill, 2013.	r security	The Ess	sential B	ody Of	Knowled	lge, 1st e	ed. Cenga				
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 2. Dan Shoer Learning 2 3. Rhodes–C McGraw– E–References 1. <u>https://ww</u> 2. www.np 3. <u>http://pro</u> 	maker Cyber 2011 Jusley, Marl Hill, 2013. ww.coursera tel.ac.in ofessional.mi	r security k, "Inforn a.org/spec it.edu/pro	The Ess mation S cialization	sential B Security: ons/cybe hort-pro	ody Of The Co r-securi	Knowlec omplete ty pplied_	lge, 1st e	ed. Cenga ce", Secc	ond Edition			
 2. Dan Shoer Learning 2 3. Rhodes–C McGraw– E–References 1. <u>https://ww</u> 2. www.np 3. <u>http://procybersect</u> 	maker Cyber 2011 Dusley, Marl Hill, 2013. ww.coursera tel.ac.in ofessional.mi urityhttps://u	r security k, "Inforn Lorg/spec it.edu/pro Is.norton.	The Ess mation S <u>cializatio</u> ograms/s .com/int	sential B Security: ons/cybe hort-pro	ody Of The Co r-securi	Knowlec omplete ty pplied_	lge, 1st e	ed. Cenga ce", Secc	ond Edition			
 2. Dan Shoer Learning 2 3. Rhodes–C McGraw– E–References 1. <u>https://ww</u> 2. www.np 3. <u>http://procybersectpractices</u> 	maker Cyber 2011 Jusley, Marl Hill, 2013. ww.coursera tel.ac.in ofessional.mi urityhttps://u -for-employ	r security k, "Inforn a.org/spec it.edu/pro is.norton. yees. htm	The Ess mation S <u>cializatio</u> ograms/s .com/int <u>1</u>	sential B Security: ons/cybe hort-pro ernetsec	ody Of The Co r-securi	Knowlec omplete ty pplied_	lge, 1st e	ed. Cenga ce", Secc	ond Edition			
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 2. Dan Shoer Learning 2 3. Rhodes–C McGraw– E–References <u>https://ww</u> www.np <u>http://procybersectpractices</u> <u>https://ww</u> CO 1 	maker Cyber 2011 Dusley, Marl Hill, 2013. ww.coursera tel.ac.in ofessional.mi urityhttps://u _for_employ ww.meity.go	r security k, "Inform Lorg/spec it.edu/pro is.norton. yees. htm ov.in/cont PO2 0	The Ess mation S cializatio ograms/s com/int <u>1</u> tent/cybe C PO3 0	sential B Security: ons/cybe hort-pro- ernetsec er-laws COs vs F PO4 0	ody Of The Control The Contro	Knowled omplete ty pplied_ w_to_cy PO6 2	lge, 1st e Referen /ber-sec PO7 0	ed. Cenga ce", Secc urity-bes PO8 3	end Edition			
 2. Dan Shoer Learning 2 3. Rhodes–C McGraw– E–References 1. <u>https://ww</u> 2. www.np 3. <u>http://procybersectpractices</u> 4. <u>https://ww</u> CO 1 CO 2 	maker Cyber 2011 Dusley, Marl Hill, 2013. ww.coursera tel.ac.in ofessional.mi urityhttps://u _for_employ ww.meity.go PO 1 0 0	r security k, "Inform a.org/spec it.edu/pro is.norton. yees. htm ov.in/cont PO2 0 0	The Ess mation S cializatio ograms/s com/int <u>1</u> tent/cybe C PO3 0 0	sential B Security: ons/cybe hort-pro ernetsec er-laws COs vs F OS vs F 0 0 0	ody Of The Control of the control of	Knowled omplete ty pplied_ w_to_cy PO6 2 0	lge, 1st e Referen /ber-sec PO7 0 2	ed. Cenga ce", Secc urity-bes PO8 3 0	end Edition			
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SCALED VALUE	2	0	0	0	0	1	1	1	2
0 - No Relation, 1	l – Low	Relation	, 2- Med	lium Re	lation,	3- High	Relation		
$1-5 \rightarrow 1, 6-10 \rightarrow 2$	2, 11-15	→3							

3.b. Curriculum and Syllabus of M.Sc Mathematics - Before Revision

MASTER OF SCIENCE (TWO YEAR - FULL TIME) REGULATION - 2022

(Applicable to the students admitted from the academic year 2022-2023 onwards)

Semester	Course Code	Course Name	L	Т	Р	Н	С
	YMA101	Algebra - I	4	1	0	5	5
	YMA102	RealAnalysis - I	4	1	0	5	5
т	YMA103	Graph Theory	4	1	0	5	5
Ι	YMA104	Ordinary Differential Equations	4	1	0	5	5
	YMA105	Optimization Techniques	4	1	0	5	5
	YMA1E*	One among the list of electives (1E)	3	0	0	3	3
		Mentoring	0	0	0	1	0
		Library/ E- Library	0	0	0	1	0
		Total	23	5	0	30	28

*Listof Electives (1E)

Elective Code	Course Name	L	Т	Р	С
1	Fuzzy sets and Fuzzy logic	3	0	0	3
2	Coding Theory	3	0	0	3
3	Neural Networks	3	0	0	3

Semester	Course Code	Course Name	L	Т	Р	Η	С
	YMA201	Algebra -II	4	1	0	5	5
	YMA202	Real Analysis -II	4	1	0	5	5
II	YMA203	Partial Differential Equations	4	1	0	5	5
	YMA204	Classical Dynamics	4	1	0	5	5
	YMA2E*	One among the list of electives (2E)	3	0	0	3	3
NME	YMA205	Computer Programming (c++ Theory and Lab)	3	0	2	5	5
		Mentoring	0	0	0	1	0
		Library/ E- Library	0	0	0	1	0

Total 22 4 2 30 28	
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*List of Electives (2E)

Elective Code	Course Name	L	Т	Р	С
1	Fluid Dynamics	3	0	0	3
2	Combinatorics	3	0	0	3
3	Cryptography	3	0	0	3

Semester	Course Code	Course Name	L	Т	Р	Η	С
	YMA301	Topology	4	1	0	5	5
	YMA302	Integral Equations, Calculus of Variations and Transforms	4	1	0	5	5
III	YMA303	Functional Analysis	4	1	0	5	5
	YMA304	Differential Geometry	4	1	0	5	5
	YMA305	Complex Analysis	4	1	0	5	5
	YMA3E*	One among the list of Electives (3E)	3	0	0	3	3
		Mentoring	0	0	0	1	0
		Library/ E- Library		0	0	1	0
		Total	23	5	0	30	28

*List of Electives (3E)

Elective code	Course Name	L	Т	Р	С
1	Elements of Stochastic Processes	3	0	0	3
2	Mathematical Modeling	3	0	0	3
3	Data Analysis using SPSS	3	0	0	3

Semester	Course Code	Course Name	L	Τ	Р	Н	С
IV	YMA401	Project	0	0	0	30	8
		Total				30	8

 $\label{eq:Mandatory: Value Added course and Self Learning Course - (NPTEL) will be offered during$

theprogramme

Total Number of Credits: 92

Total Number of Hours :120

COURSE CODEYMA1014105CPALTPH50004105PREREQUISITEBasics of sets, relations and functionsOn successful completion of this course, the students will be able to:COURSE OUTCOMESDOMAINLEVELCOURSE OUTCOMESDOMAINLEVELCOURSE OUTCOMESCognitiveApplyingCO1ConstructCayley table for the given symmetric group of degree 2 and 3CognitiveUnderstandingCognitiveCognitiveApplyingCO2Extend group structure to finite order upto 120 using Sylow's theoremsCognitiveAnalyzingUNIT 1Is hoursIdentify the quotient field of the given integral domainCognitiveAnalyzingUNIT 1Is hoursIsomorphisms - Groups - Subgroups - Permutations II - Cyclic GroupsUNIT 2Is hoursIsomorphisms - Direct Products - Finitely Generated Abelian groups - Groups of Cosets - Normal subgroups and factor groups - HomomorphismsIntegral Domains - Some non-commutative examples - The Field of quotients - Quotient rings and Ideal.UNIT 3Is hours </th <th>COU</th> <th>JRSE N.</th> <th>AME</th> <th></th> <th>AL</th> <th>GEBRA</th> <th>- I</th> <th>L</th> <th>Т</th> <th>Р</th> <th>С</th>	COU	J RSE N .	AME		AL	GEBRA	- I	L	Т	Р	С	
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CO 4 domain Cognitive domain Applying CO 5 Categorize the factorization of polynomials over a field Cognitive Anury UNIT 1 Cognitive Is hours Binary Operations – Groups - Subgroups – Permutations I – Permutations I – Cyclic Is hours UNIT 2 Is hours Is hours Isomorphisms – Direct Products – Finitely Generated Abelian groups - Groups of Cosets - Normal subgroups and factor groups- Homomorphisms Is hours UNIT 3 Isomorphism theorems- Proof of the Jordan Holder theorem—Group action on a set- Applications of G-sets to counting - Sylow's theorems – ApplicationsofUow theorem Is hours UNIT 4 Is hours Is hours Rings – Integral Domains - Some non-commutative examples –The Field of quotients – Quot=nt rings and Ideal. Is hours UNIT 5 Is hours Is hours Homomorphism of Rings – Rings of polynomials – Factorization of Polynomialsovariafield – Euclideanians-Gaussian integers and norms Is hours	CO 3			oups c	of finite order	upto 12	0 using Sylow's	Cognit	ive	Ana	lyzing	
UNIT 115 hoursBinary Operations – Groups - Subgroups – Permutations II – Permutations II – Cyclic GroupsUNIT 215 hoursIsomorphisms – Direct Products – Finitely Generated Abelian groups - Groups of Cosets - Normal subgroups and factor groups- Homomorphisms15 hoursUNIT 315 hoursSeries of Groups – Isomorphism theorems- Proof of the Jordan Holder theorem—Group action on a set- Applications of G-sets to counting - Sylow's theorems – ApplicationsofSylow theorems15 hoursUNIT 415 hoursRings – Integral Domains - Some non-commutative examples –The Field of quotients – Quotient rings and Ideal.15 hoursUNIT 515 hoursHomomorphism of Rings – Rings of polynomials – Factorization of Polynomialsov-rafield – Euclideandomains-Gaussian integers and norms15 hours	CO 4		-	e quot	tient field of	the give	n integral	Cognit	ive	Apj	olying	
Binary Operations – Groups - Subgroups – Permutations I – Permutations II – Cyclic GroupsUNIT 215 hoursIsomorphisms – Direct Products – Finitely Generated Abelian groups - Groups of Cosets - Normal subgroups and factor groups - Homomorphisms15 hoursUNIT 315 hoursSeries of Groups – Isomorphism theorems- Proof of the Jordan Holder theorem—Group action a set- Applications of G-sets to counting - Sylow's theorems – ApplicationsofSylow theorems15 hoursUNIT 415 hoursUNIT 515 hoursUNIT 515 hoursUNIT 515 hoursUNIT 615 hoursUNIT 715 hours	CO 5	Cat	egorize	the fac	torization of po	lynomial	s over a field	Cognit	ive	Ana	lyzing	
UNIT 215 hoursIsomorphisms – Direct Products – Finitely Generated Abelian groups - Groups of Cosets - Normal subgroups and factor groups- Homomorphisms15 hoursUNIT 315 hoursSeries of Groups – Isomorphism theorems- Proof of the Jordan Holder theorem—Group action on a set- Applications of G-sets to counting - Sylow's theorems – ApplicationsofSylow theorems15 hoursUNIT 415 hoursRings – Integral Domains - Some non-commutative examples –The Field of quotients – Quotient rings and Ideal.15 hoursUNIT 515 hoursHomomorphism of Rings – Rings of polynomials – Factorization of Polynomialsoverafield – Euclidean-Gaussian integers and norms15 hours	UNIT	1									15 hours	
Isomorphisms – Direct Products – Finitely Generated Abelian groups - Groups of Cosets - Normal subgroups and factor groups- HomomorphismsUNIT 315 hoursSeries of Groups – Isomorphism theorems- Proof of the Jordan Holder theorem—Group act- Applications of G-sets to counting - Sylow's theorems – ApplicationsofSylow theoremson a set- Applications of G-sets to counting - Sylow's theorems – ApplicationsofSylow theoremsUNIT 415 hoursRings – Integral Domains - Some non-commutative examples – The Field of quotients – Quott- rings and Ideal.15 hoursUNIT 515 hoursHomom-phism of Rings – Rings of polynomials – Factorization of Polynomialso Euclideanians-Gaussian integers and norms15 hours	Binary	Operati	ions – G	roups -	- Subgroups – P	ermutatio	ons I – Permutation	is II – Cy	clic C	Groups		
subgroups and factor groups - Homomorphisms INIT 3 Series of Groups – Isomorphism theorems- Proof of the Jordan Holder theorem—Group acti- on a set- Applications of G-sets to counting - Sylow's theorems – ApplicationsofSylow theorems on a set- Applications of G-sets to counting - Sylow's theorems – ApplicationsofSylow theorems 15 hours INIT 4 Isomorphism of G-sets to counting - Some non-commutative examples – The Field of quotients – Quotient rings and Ideal. UNIT 5 Isomorphism of Rings – Rings of polynomials – Factorization of Polynomialsoverafield – Euclidean-Gaussian integers and norms	UNIT	2									15 hours	
UNIT 315 hoursSeries of Groups – Isomorphism theorems- Proof of the Jordan Holder theorem—Group action on a set- Applications of G-sets to counting - Sylow's theorems –ApplicationsofSylow theoremson a set- Isomorphism theoremsUNIT 415 hoursRings – Integral Domains - Some non-commutative examples –The Field of quotients – Quotient rings and Ideal.15 hoursUNIT 515 hoursHomomorphism of Rings – Rings of polynomials – Factorization of Polynomialsoverafield – Euclideandomains-Gaussian integers and norms15 hours	Isomo	rphisms	– Dire	ct Prod	lucts – Finitely	Generat	ed Abelian groups	s - Grou	ps of	Cosets	- Normal	
Series of Groups – Isomorphism theorems- Proof of the Jordan Holder theorem—Group action on a set- Applications of G-sets to counting - Sylow's theorems – ApplicationsofSylow theorems UNIT 4 15 hours Rings – Integral Domains - Some non-commutative examples –The Field of quotients – Quottert rings and Ideal. 15 hours UNIT 5 15 hours Homomorphism of Rings – Rings of polynomials – Factorization of Polynomialsov-rafield – Euclideandomains-Gaussian integers and norms 15 hours	subgro	oups and	factor g	groups-	Homomorphism	ns						
Applications of G-sets to counting - Sylow's theorems – ApplicationsofSylow theorems UNIT 4 15 hours Rings – Integral Domains - Some non-commutative examples –The Field of quotients – Quotient rings and Ideal. Integral Domains - Quotient rings UNIT 5 15 hours Homomorphism of Rings – Rings of polynomials – Factorization of Polynomialsoverafield – Euclideandomains-Gaussian integers and norms Integral polynomials – Factorization of Polynomialsoverafield – Euclideandomains-Gaussian integers and norms	UNIT	3									15 hours	
Image: Provide and the second structure of the	Series	of Grou	ps – Iso	morph	ism theorems- I	Proof of t	he Jordan Holder t	heorem-	-Gro	up action	n on a set-	
Rings – Integral Domains - Some non-commutative examples –The Field of quotients – Quotient rings and Ideal. UNIT 5 15 hours Homomorphism of Rings – Rings of polynomials – Factorization of Polynomialsoverafield – Euclideandomains-Gaussian integers and norms	Applic	cations o	f G-sets	to cou	nting - Sylow's	theorem	s – Applicationsof S	ylow the	orem	8		
and Ideal. UNIT 5 15 hours Homomorphism of Rings – Rings of polynomials – Factorization of Polynomialsoverafield – Euclideandomains-Gaussian integers and norms	UNIT	4									15 hours	
UNIT 5 15 hours Homomorphism of Rings – Rings of polynomials – Factorization of Polynomialsoverafield – Euclideandomains-Gaussian integers and norms	-	-	al Doma	ains - S	ome non-comm	utative e	xamples –The Field	d of quot	ients -	– Quotie	ent rings	
Homomorphism of Rings – Rings of polynomials – Factorization of Polynomialsoverafield – Euclideandomains-Gaussian integers and norms											15 hours	
Euclideandomains-Gaussian integers and norms			m of I	Rings	– Rings of p	olynomia	als – Factorizatio	on of Po	olyno	mialsove		
LECTURE 60 TUTORIAL 15 PRACTICAL 0 TOTAL 75		_		_					5			
	LEC	TURE	6	0	TUTORIAL	15	PRACTICAL	0	T	DTAL	75	

TEXT BOOK

1. John B. Fraleigh, A First Course in Abstract Algebra, Narosa Publishing House, Third edition, 1992.

UNIT – I Chapter 1, 2, 3,4,5,6

UNIT - II Chapter 7,8,9,11,12,13

UNIT - III Chapter 14,15,16,17,18,19

UNIT – IV Chapter 23,24,25,26,27,28

UNIT – V Chapter 29,30,31,33,34

REFERENCES

1.P.B. Bhattacharya et al., Basic Abstract Algebra, 2nd edition, Cambridge University Press, 1995

2.I.N.Herstein, Topics in Algebra, John Wiley, 2nd Edition, 1975.

3.R. Solomon, Abstract Algebra, AMS Indian edition, 2010.

CO Vs PO

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	3	1	1	1	1
CO 2	3	3	2	1	3	1	0	1	1
CO 3	3	3	3	1	3	1	1	1	1
CO 4	3	3	3	1	3	1	1	1	1
CO 5	3	3	3	1	3	1	1	1	1
TOTAL	15	15	14	6	15	5	4	1	5
SCALED VALUE	3	3	3	2	3	1	1	1	1
0 - No Relation, 1 – L	ow Relatio	on, 2- Me	dium Re	elation, 3	- High R	elation	1		1
1-5→1, 6-10→2, 11-1	5→3								

COU	RSE N	AME	REAL ANALYSIS - I	L	Т	Р	С
COU	JRSE C	CODE	YMA102	4	1	0	5
С	Р	Α		L	Т	Р	Н
5	0	0		4	1	0	5
PRER	EQUIS	SITE	Basic concepts of real numbers				
On su	ccessfu	l comple	tion of this course, the students will be able to:				
			COURSE OUTCOMES	DOMA	IN	LEV	VEL
CO 1	-	plain the ebraic pr	e concepts of real number system and its operties	Cognit	ive	Unders	tanding
CO 2	Exp	olain the	concepts of metric space and its properties	Cognit	ive	Unders	tanding
CO 3	Ap	ply conv	ergence sequence in metric space	Cognit	ive	App	lying
CO 4		s sify th metrical	Cognit	ive	Analyzing		
CO 5		lize the	Cognit	ive	App	lying	
UNIT	1				I	1	5 hours
Sets an	nd Fund	ctions, N	Iathematical Induction, Finite and Infinite sets. I	Real Nur	nber s	system: A	Algebraic
and Or	der pro	perties:	Infimum, Supremum, LUB Axiom. Countable and	uncount	able s	ets.	
UNIT	2					1	5 hours
Metric	spaces	– Defini	tion and examples - open balls and open sets				
UNIT	3					1	5 hours
Sequer	nces an	d Series	of real numbers - limit theorems - monotone	sequence	s – C	Cauchy cr	riterion –
limsup	, liminf	f - Conve	ergent sequences in metric spaces – limit and clus	ter point	s – Ca	uchy seq	uences –
Bound	ed sets	– Dense	sets.				
UNIT							5 hours
Contin	uous fu	inctions	- Equivalent Definitions of Continuity - Uniform	Continu	ity - L	limit of a	function
			a Real Valued function - Compact spaces and	_	ropert	ies – Co	ontinuous
		Compact	spaces- Characterization of Compact Metric space	es.			
UNIT							5 hours
Conne	ctednes	s: Conn	ected spaces - Complete metric spaces - Examp	ples- Ba	ireCat	egory Th	neorem –

Banach Contraction Principle.

LECTURE 60 TUTORIAL 15 PRACTICAL 0 TOTAL 75											
TEXT BOOKS											
1. R.G. Bartle and D.R. Sherbert,Introduction to Real Analysis 3 rd Edn,John Wiley &Sons, 2000.											

2. S.Kumaresan, Topology of Metric Spaces, Narosa Publishing House, New Delhi, 2005.

UNIT–I- Chapters 1 and 2from [1]

UNIT–II -Chapter1from [2]

UNIT–III-Chapter3from [1]andChapter2sections 2.1to2.5 from[2]

UNIT-IV-Chapter3, Chapter4from[2](sections3.3and 3.6omitted)and Chapter5 from [1]

UNITV-Chapter 5section5.1andChapter 6sections 6.1,6.3and6.4(section6.2,6.3.16 and6.3.17 omitted)from [2]

REFERENCES

- 1. EdwardD.Gaughan, IntroductiontoAnalysis, AMS, Indianedition, 2010.
- 2. KennethA. Ross, Elementary Analysis: The Theory of Calculus, Springer Verlag, 2004.
- 3. WalterRudin, Principles of Mathematical Analysis, ThirdEdition, McGrawHill, 1976.

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	3	1	0	1	1
CO 2	3	3	2	1	3	1	0	1	1
CO 3	3	3	3	2	3	1	1	1	1
CO 4	3	3	3	3	3	1	2	1	1
CO 5	3	3	3	2	3	1	1	1	1
TOTAL	15	15	13	9	15	5	4	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1

COs VS POs

1 cdot 5 cdot 1, 6 cdot 10 cdot 2, 11 cdot 15 cdot 3

COU	IRSE N	AME		GRAI	PH THE	ORY	L	Т	P	С
COL	J RSE C	ODE		Y	MA103		4	1	0	5
С	Р	Α					L	Т	Р	Н
5	0	0					4	1	0	5
PRER	EQUIS	ITE	Basic	c concepts of Gr	aphs			1		
On su	ccessful	comple	etion of	f this course, th	e studen	ts will be able to:				
			COU	RSE OUTCOM	IES		DOMA	IN	LI	EVEL
CO 1	Exp	olainbas	ic conc	epts of graphs			Cognit	ive	Unde	rstanding
CO 2	Exp	olain ver	tex con	nnectivity and e	dge conn	ectivity in graphs	Cognit	ive	Unde	rstanding
CO 3	Exp	olainEul	erian C	Braphs and Ham	iltonian (Graphs	Cognit	ive	Unde	rstanding
CO 4	Apj	olycolor	ing pr	inciple for sol	ving pro	blems in Vertex	Cognit	ive	An	plying
004	colorings and Edge coloring						prjing			
CO 5							rstanding			
						15 hours				
Basic	Concep	ts - Sub	graphs	- Degrees of V	/ertices -	Paths and Connect	ctedness	Opera	tions of	n Graphs -
Directe	ed Grap	hs: Basi	c Conc	epts - Tournam	ents.					
UNIT	2				Connect	ivity				15 hours
Vertex	Cuts a	nd Edge	Cuts -	Connectivity a	nd Edge	- Connectivity, Tre	ees:Defin	ition	s, Chara	cterization
and Si	mple Pr	operties	- Cour	nting the Numbe	er of Spar	ning Trees - Cayle	ey's Form	nula.		
UNIT				-		and Matchings				15 hours
	-				rings - I	Edge Independent	Sets -M	atchi	ngs and	Factors -
Euleria	an Grap	hs - Han	niltonia	an Graphs.						
UNIT					aph Col	8				15 hours
		ring - Cı	ritical (Graphs - Triang	le - Free	Graphs - Edge Co	olourings	of G	raphs -	Chromatic
Polync										
UNIT					Planar	•				15 hours
		-	-			its Consequences				-
-				raph - The Four	-Colour '	Theorem and the H	Heawood	Five	-Colour	Theorem-
		Theoren	1.	1						
LEC	TURE	6	0	TUTORIAL	15	PRACTICAL	0	T	OTAL	75

TEXT BOOK

1.Douglas B. West, "Introduction to Graph Theory", Prentice Hall of India, Second Edition, 2002.

REFERENCES

- 1. Bondy J. A, and Murty U. S. R., "Graph Theory", Springer, 2008.
- 2. Balakrishnan R. and Ranganathan K., "A textbook of Graph Theory", Springer, 2012.
- 3. Graham R.L., Rothschild B.L and Spencer J.H., "Ramsey Theory", Wiley Publishers, Second Edition, 1990.
- 4. Biggs N., "Algebraic Graph Theory", Cambridge Tracts in Mathematics 67, Cambridge University Press, 1994. MX8003 Algebraic Theory of Semigroups.

COs VS POs

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	3	1	0	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	2	1	3	1	0	1	1
CO 4	3	3	3	2	3	1	1	1	1
CO 5	3	3	2	1	3	1	0	1	1
TOTAL	15	15	12	7	15	5	2	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1
0 - No Relation, 1 – L	ow Relatio	on, 2- Me	dium Re	elation, 3	- High R	elation	1	1	1

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$

COURS C I		ODE					
_		ODL	YMA104	4	1	0	5
_		А		L	Т	Р	Н
5 (0	0		4	1	0	5
PREREQ	UISI	ITE	Knowledge in differentiation		1		
On succes	sful	comple	tion of this course, the students will be able to:				
			COURSE OUTCOMES	DOMA	IN	LE	VEL
CO 1			theory of power series when solving second ential equations	Cognit	ive	App	lying
CO 2		-	broblems arises in mathematical physics using f Bessel functions	Cognit	ive	App	lying
CO 3		•	d's theorem for calculating exact solution for a value problem	Cognit	ive	App	lying
CO 4	eiger		ne classical vibrating string problem through and eigenfunctions with given boundary	Cognit	ive	Analyzing	
CO 5		t ify cr	itical points and phase portrait of nonlinear	Cognit	ive	App	lying
UNIT 1]	15 hours
The gener	al so	lution of	of the homogeneous equation – The use of one kn	nown so	lutior	n to find a	another –
The metho	od of	f variati	on of parameters - Power Series solutions. A re-	eview of	f pow	ver series	- Series
solutions of	of firs	st order	equations – Second order linear equations; Ordina	ry points	5.		
UNIT 2]	15 hours
Regular S	lingu	lar Poi	nts – Gauss's hypergeometric equation – The	Point	at in	finity -	Legendre
Polynomia	ıls −	Bessel 1	functions – Properties of Legendre Polynomials and	d Bessel	func	tions.	
UNIT 3]	15 hours
Linear Sys	stems	s of Fir	st Order Equations – Homogeneous Equations wi	th Cons	tant (Coefficie	nts – The
Existence	and	Unique	ness of Solutions of Initial Value Problem for Fi	rst Orde	er Or	dinary Di	fferential
Equations	– Th	e Meth	od of Solutions of Successive Approximations and	Picard's	s The	orem.	
UNIT 4]	15 hours

Oscillation The	eory and B	oundary value p	problem	s – Qualitative Pr	roperties	of Solution	ns– Sturm
Comparison Th	eorems – Eig	genvalues, Eigenf	unction	s and the Vibrating S	String.		
UNIT 5							15 hours
Nonlinearequat	ions:Autono	mousSystems;the	phasepla	aneanditsphenomena	a–Types		of
criticalpoints;St	ability – cri	tical points and	stability	for linear systems	– Stabi	litybyLiapun	ov's direct
method – Simp	e critical po	intsof nonlinear s	ystems.				
LECTURE	60	TUTORIAL	15	PRACTICAL	0	TOTAL	75
TEXT BOOK		-				1	
1 G F Simmon	Differenti	al Equations with	Applica	tions and Historical	Notes 7	TMH New D	elhi

1974.

UNIT – I -Chapter 3: Sections 15, 16, 19 and Chapter 5: Sections 25 to 27

UNIT - II -Chapter 5 : Sections 28 to 31 and Chapter 6: Sections 32 to 35

UNIT - III - Chapter 7: Sections 37, 38 and Chapter 11: Sections 55, 56

UNIT – IV -Chapter 4: Sections 22 to 24

UNIT - V -Chapter 8: Sections 40 to 44

REFERENCES

1. M.E. Taylor, Introduction to Differential Equations, AMS Indian Edition, 2011.

2. M. Braun, Differential Equations and Their Applications, Springer, 1992.

3. E.A. Coddington and N. Levinson, Theory of Ordinary Differential Equations, McGraw Hill, 1955.

COs VS POs

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	3	1	1	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	3	2	3	1	1	1	1
CO 4	3	3	3	3	3	1	2	1	1
CO 5	3	3	3	2	3	1	1	1	1
TOTAL	15	15	15	11	15	5	6	5	5
SCALED VALUE	3	3	3	3	3	1	2	1	1

0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation

 $1 ext{-}5 ext{-}1, 6 ext{-}10 ext{-}2, 11 ext{-}15 ext{-}3$

COUR	SE NAN	ME		OPTIMIZAT	ION TE	CHNIOUES	L	Т	P	С		
COURSE CODE					MA105		4	1		5		
C	P	Α					L	Т	P	H		
5	0	0					4	1	0	5		
PREREC	JUISIT	'E	Proba	ability and rande	om proce	58				1		
On successful completion of this course, the students will be able to:												
COURSE OUTCOMES DOMAIN								IN	LEVEL			
	Explain the systematic way of approaching a decision											
CO 1						he possibility of	Cognitive Understand			standing		
	occurre	ence c	of diffe	erent outcomes a	re evalua	ted in advance.	_			_		
<u> </u>	Solve	the a	bilities	s in project ev	aluation	techniques using	<u> </u>	1 '				
CO 2	PERT,	CPM	[Cognit	olying				
CO 3	Explai	in tł	he dy	mamics of	inventory	management's	Carrie		TT., 1.	tondia -		
003	princip	oles, c	oncept	s, and technique	es		Cognit	standing				
CO 4	Solve 1	fourth	order	polynomial fun	ction usir	ng Newton	Cognit	ivo	App	olying		
CU 4	Raphso	on Me	ethod				Cogint	Cognitive				
CO 5	Apply	the d	irect s	earch method	and grad	lient method for	Cognit	Cognitive Applying				
05	obtaini	ing op	otimal s	solutions for the	given fu	nction	Cogint	Cognitive				
UNIT 1				DEC	ISION 1	HEORY				15 hours		
Steps in l	Decision	n theor	ry App	roach - Types c	of Decisio	n-Making Enviror	nments -	Decis	sion Maki	ing Under		
Uncertain	nty - De	ecisior	n Maki	ing under Risk	- Posteri	or Probabilities ar	nd Bayesi	an A	.nalysis -	Decision		
Tree Ana	lysis - D	Decisio		king with Utiliti								
UNIT 2			PR	OJECT MANA	AGEME	NT: PERT AND	CPM			15 hours		
					-	n PERT/CPM Te	-					
-				_		Path Analysis -		ity in	PERT A	Analysis -		
-	me-cost				-	esource Allocation						
UNIT 3						RY CONTROL				15 hours		
U		•				tion - Advantage	•	U	•			
	of Inventory System - Inventory Model building - Deterministic Inventory Models with no shortage -									-		
Deterministic Inventory with ShortagesProbabilistic Inventory Control Models:Single Period												
Probabilistic Models without Setup cost - Single Period Probabilities Model with Setup cost.												
UNIT 4			• •		-	ation Theory				15 hours		
Unconstrained Problems-Necessary and Sufficient Conditions- The Newton-Raphson Method-												
Constrained Problems- Equality Constraints- Inequality Constraints.												
UNIT 5 Nonlinear Programming Algorithms 15 hours												
	Unconstrained Algorithms- Direct Search Method- Gradient Method- Constrained Algorithms-											
Quadratic Programming- Chance-Constrained Programming LECTUDE (0) TUTODIAL 15 DDACTUCAL 0												
LECTU		6	U	TUTORIAL	15	PRACTICAL	0	ľ	OTAL	75		
TEXT B)n '	iona D	agaarah The-	and A.	lipptions? This 1	E.4:4:	١/.	amail1a T	ndia I 11		
1.J.K.Sha	uma, C	operat	lions R	lesearch Theory	anu Ap	olications", Third	Edition,	IVIA	cmillan I	nula Lta.,		

2007

Unit I - Chapter-11 (Section 11.1 - 11.8)

Unit II - Chapter-13 (Section 13.1 - 13.9)

Unit III - Chapter-14 (Section 14.1 - 14.8); Chapter-15 : (Section15.1 - 15.4)

2.Hamdy A Taha, Operations Research: An Introduction, Eighth Edition,. University of Arkansas,

Fayetteville, PEARSON Prentice Hall. © 2007 by Pearson Education, Inc.

Unit IV-Chapter 18 – Section 18.1.1, 18.1.2, 18.2.1, 18.2.2

Unit V-Chapter 19 – Section 19.1.1, 19.1.2, 19.2.2 and 19.2.3

REFERENCES

- 1. HillierF.S. andJ.Lieberman, "Introduction to Operations Research" (8th Edition), Tata McGraw Hill Publishing Company, New Delhi, 2006.
- 2. Beightler. C, D.Phillips, B. Wilde, "Foundations of Optimization" (2nd Edition) Prentice Hall Pvt Ltd., New York, 1979
- 3. Bazaraa, M.S; J.J.Jarvis, H.D.Sharall, "Linear Programming and Network flow", John Wiley and sons, New York, 1990.
- 4. Gross, D and C.M.Harris, "Fundamentals of Queueing Theory", (3rd Edition), Wiley and Sons, New York, 1998.
- 5. Hamdy A. Taha, "Operations Research" (sixth edition), Prentice Hall of India PrivateLimited, New Delhi.2007

COs VS POs

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	3	1	0	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	2	1	3	1	0	1	1
CO 4	3	3	2	1	3	1	0	1	1
CO 5	3	3	2	1	3	1	0	1	1
TOTAL	15	15	11	6	15	5	1	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1
0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation									
$1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$									

COU	JRSE	NAME		FUZZY SETS	AND FU	ZZY LOGIC	L	Т	Р	C				
COU	URSE	CODE		Y	MA1E1		3	0	0	3				
С	Р	Α					L	Т	Р	Н				
3	0	0					3	0	0	3				
PRER	EQUI	SITE	Basic	c concepts of se	ts		•	1	•					
On su	ccessf	ıl compl	etion o	f this course, tl	ne studen	ts will be able to:								
			COU	RSE OUTCON	IES		DOMA	IN	LE	VEL				
CO 1														
CO 2														
CO 3														
CO 4														
CO 5														
UNIT														
Crisp	sets ba	ts basic definitions - the notion of fuzzy sets - basic concepts of fuzzy sets												
UNIT	IT 2 Operation on FuzzySets 9 hours													
Fuzzy	compl	ement - f	uzzy u	nion - fuzzy inte	ersection	- combination and	general a	ggrega	ation op	erations				
UNIT	3			F	'uzzy Rel	ations				9 hours				
Crisp	and fu	zzy relat	ions -	binary relation	- equival	ence and similarity	y relation	ns - to	lerance	relations-				
orderi														
UNIT					Classical	6				9 hours				
		contradi	ictions	- equivalence -		OR and exclusive	NOR - lo	ogical						
UNIT					Fuzzy L	8				9hours				
	-				-	es - contradictions	-			_				
	TURE		15	TUTORIAL	0	PRACTICAL	0	ТО	TAL	45				
TEXT														
	-				Sets, Un	certainty, and Info	ormation'	', Pren	tice Hal	I of India				
		New De			- · ·	A 1	0 1 1.			TT'11 T				
	•	J. Koss,	"Fuzz	y Logic with I	ngineerii	ng Applications",	3rd edit	ion, M	cGraw-	Hill. Inc,				
20	10.													

REFERENCES

- 1. Zimmermann. H.J, "Fuzzy Set Theory and Its Applications", 4th edition, Springer, Netherlands, 2015.
- 2. Bart Kosko, "Neural Networks and Fuzzy Systems", Prentice-Hall International, 1992.

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	3	1	1	1	1
CO 2	3	3	2	1	3	1	0	1	1
CO 3	3	3	3	2	3	1	1	1	1
CO 4	3	3	2	1	3	1	0	1	1
CO 5	3	3	2	1	3	1	0	1	1
TOTAL	15	15	12	7	15	5	2	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1
0 - No Relation, 1 – L	ow Relatio	on, 2- Me	edium Re	elation, 3	- High R	elation	1	1	1
$1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-1$	5→3								

3 0 0 3 0 PREREQUISITE Linear algebra On successful completion of this course, the students will be able to: COURSE OUTCOMES DOMAIN COURSE OUTCOMES DOMAIN Course of the maximum likelihood decoding rule to decode the received words Cognitive Cognitive generator matrix and parity check matrix for the given binary linear code Cognitive Cognitive generator polynomial for all binary cyclic codes of given length Cognitive Cognitiv	0 3 P H 0 3		
3 0 0 3 0 PREREQUISITE Linear algebra On successful completion of this course, the students will be able to: COURSE OUTCOMES DOMAIN Course outcomes Utilize the maximum likelihood decoding rule to decode the received words Cognitive Cognitive generator matrix and parity check matrix for the given binary linear code Cognitive does of given length Cognitive colspan="2">Cognitive cognitive does of given length Cognitive colspan="2">Cognitive decoding of narrow-sense binary BCH codes Cognitive colspan="2">Cognitive decoding – Distance of a cod UNIT 1 Error detection, Correction and decoding: Communication channels – Maximum likelihood Hamming distance – Nearest neighborhood minimum distancedecoding – Distance of a cod UNIT 2 Linear codes – Self orthogonal codes – Self dual codes – Bases forli Generator matrix and parity check matrix – Encoding with a linear code – Decoding of 1			
PREREQUISITE Linear algebra On successful completion of this course, the students will be able to: COURSE OUTCOMES DOMAIN CO 1 Utilize the maximum likelihood decoding rule to decode the received words Cognitive CO 2 Identify a generator matrix and parity check matrix for the given binary linear code Cognitive Cognitive CO 3 Explain various bounds involved in coding theory Cognitive Unity CO 4 Construct the generator polynomial for all binary cyclic codes of given length Cognitive August and accoding: Communication channels – Maximum likelihood minimum distancedecoding – Distance of a cod UNIT 1 Error detection, Correction and decoding: Communication channels – Maximum likelihood minimum distancedecoding – Distance of a cod UNIT 2 Linear codes: Linear codes – Self orthogonal codes – Self dual codes – Bases forlin Generator matrix and parity check matrix – Encoding with a linear code – Decoding of 1 Syndrome decoding.	0 3		
On successful completion of this course, the students will be able to: COURSE OUTCOMES DOMAIN C0 1 Utilize the maximum likelihood decoding rule to decode the received words Cognitive C0 2 Identify a generator matrix and parity check matrix for the given binary linear code Cognitive C0 3 Explain various bounds involved in coding theory Cognitive C0 4 Construct the generator polynomial for all binary cyclic codes of given length Cognitive C0 5 Examine the decoding of narrow-sense binary BCH codes Cognitive UNIT 1			
CO 1 Utilize the maximum likelihood decoding rule to decode the received words Cognitive CO 2 Identify a generator matrix and parity check matrix for the given binary linear code Cognitive Cognitive CO 3 Explain various bounds involved in coding theory Cognitive Unitive CO 4 Construct the generator polynomial for all binary cyclic codes of given length Cognitive Cognitive CO 5 Examine the decoding of narrow-sense binary BCH codes Cognitive A UNIT 1 Error detection, Correction and decoding: Communication channels – Maximum likelihood Hamming distance – Nearest neighborhood minimum distancedecoding – Distance of a cod UNIT 2 Linear codes: Linear codes – Self orthogonal codes – Self dual codes – Bases forling Generator matrix and parity check matrix – Encoding with a linear code – Decoding of 1 Syndrome decoding.	'		
CO 1 Utilize the maximum likelihood decoding rule to decode the received words Cognitive CO 2 Identify a generator matrix and parity check matrix for the given binary linear code Cognitive Cognitive CO 3 Explain various bounds involved in coding theory Cognitive Unitive CO 4 Construct the generator polynomial for all binary cyclic codes of given length Cognitive Cognitive CO 5 Examine the decoding of narrow-sense binary BCH codes Cognitive A UNIT 1 Error detection, Correction and decoding: Communication channels – Maximum likelihood Hamming distance – Nearest neighborhood minimum distancedecoding – Distance of a cod UNIT 2 Linear codes: Linear codes – Self orthogonal codes – Self dual codes – Bases forling Generator matrix and parity check matrix – Encoding with a linear code – Decoding of 1 Syndrome decoding.			
CO 1 received words Cognitive CO 2 Identify a generator matrix and parity check matrix for the given binary linear code Cognitive CO 3 Explain various bounds involved in coding theory Cognitive Unit CO 4 Construct the generator polynomial for all binary cyclic codes of given length Cognitive Cognitive CO 5 Examine the decoding of narrow-sense binary BCH codes Cognitive Cognitive UNIT 1 Error detection, Correction and decoding: Communication channels – Maximum likelihood Hamming distance – Nearest neighborhood minimum distancedecoding – Distance of a cod UNIT 2 Linear codes: Linear codes – Self orthogonal codes – Self dual codes – Bases forlin Generator matrix and parity check matrix – Encoding with a linear code – Decoding of 1 Syndrome decoding. Syndrome decoding. Encoding with a linear code – Decoding of 1	LEVEL		
CO 2 given binary linear code Cognitive Cognitive CO 3 Explain various bounds involved in coding theory Cognitive Un CO 4 Construct the generator polynomial for all binary cyclic codes of given length Cognitive Cognitive CO 5 Examine the decoding of narrow-sense binary BCH codes Cognitive A UNIT 1 Error detection, Correction and decoding: Communication channels – Maximum likelihoot Hamming distance – Nearest neighborhood minimum distancedecoding – Distance of a cod UNIT 2 Linear codes: Linear codes – Self orthogonal codes – Self dual codes – Bases forli Generator matrix and parity check matrix – Encoding with a linear code – Decoding of 1 Syndrome decoding.	Applying		
CO 4 Construct the generator polynomial for all binary cyclic codes of given length Cognitive CO 5 Examine the decoding of narrow-sense binary BCH codes Cognitive UNIT 1 Error detection, Correction and decoding: Communication channels – Maximum likelihoot Hamming distance – Nearest neighborhood minimum distancedecoding – Distance of a cod UNIT 2 Linear codes: Linear codes – Self orthogonal codes – Self dual codes – Bases forlin Generator matrix and parity check matrix – Encoding with a linear code – Decoding of 1 Syndrome decoding.	Applying		
CO 4 cyclic codes of given length Cognitive	derstandin		
UNIT 1 Error detection, Correction and decoding: Communication channels – Maximum likelihood Hamming distance – Nearest neighborhood minimum distancedecoding – Distance of a cod UNIT 2 Linear codes: Linear codes – Self orthogonal codes – Self dual codes – Bases forling Generator matrix and parity check matrix – Encoding with a linear code – Decoding of 1 Syndrome decoding.	Applying		
Error detection, Correction and decoding: Communication channels – Maximum likelihood Hamming distance – Nearest neighborhood minimum distancedecoding – Distance of a cod UNIT 2 Linear codes: Linear codes – Self orthogonal codes – Self dual codes – Bases forling Generator matrix and parity check matrix – Encoding with a linear code – Decoding of 1 Syndrome decoding.	Analyzing		
Hamming distance – Nearest neighborhood minimum distancedecoding – Distance of a cod UNIT 2 Linear codes: Linear codes – Self orthogonal codes – Self dual codes – Bases forlin Generator matrix and parity check matrix – Encoding with a linear code – Decoding of 1 Syndrome decoding.	9hours		
UNIT 2 Linear codes: Linear codes – Self orthogonal codes – Self dual codes – Bases forlin Generator matrix and parity check matrix – Encoding with a linear code – Decoding of 1 Syndrome decoding.	d decoding		
Linear codes: Linear codes – Self orthogonal codes – Self dual codes – Bases forlin Generator matrix and parity check matrix – Encoding with a linear code – Decoding of 1 Syndrome decoding.	e		
Generator matrix and parity check matrix – Encoding with a linear code – Decoding of l Syndrome decoding.	9hours		
Syndrome decoding.	near codes		
	inear code		
UNIT 3			
	9 hour		
Bounds in coding theory: The main coding theory problem – lower bounds -Sphere cove	ring bound		
Gilbert Varshamov bound - Binary Hamming codes - q-ary Hamming codes - Golay code	s – Singlet		
bound and MDS codes – Plotkin bound			
UNIT 4	9 hour		
Cyclic codes: Definitions - Generator polynomials - Generator matrix and parity che	eck matrix		
Decoding of Cyclic codes.			

UNIT 5							9 hours
Special cyclic of	codes: BCH	I codes – Param	eters o	f BCH codes – De	coding	of BCHcod	es – Ree
Solomon codes.							
LECTURE	45	TUTORIAL	0	PRACTICAL	0	TOTAL	45
TEXT BOOK							
1.San Ling and	Chaoping X	ing, Coding Theo	ory: A F	first Course, Cambrid	lge Univ	versity Press,	2004.
Unit 1 : Sections	s 2.1, 2.2, 2.	3, 2.4, 2.5					
Unit 2 : Sections	s 4.2, 4.3, 4.	4, 4.5, 4.6, 4.7, 4.	8				
Unit 3 : Sections	5.1, 5.2, 5.	3, 5.4, 5.5,					
Unit 4 : Sections	5 7.1, 7.2, 7.	3, 7.					
Unit 5 : Sections	8 8.1, 8.2						
REFERENCES	5						
1. S. Lin &D.	J. Costello	, Jr., Error Contr	ol Cod	ing: Fundamentals a	andAppl	ications, Pre	ntice-Ha
Inc., New Je	rsey,1983.						
2 Vera Pless I	ntroduction	to the Theory of	Error C	orrecting Codes, Wil	ev Nev	vYork 1982	

3. E. R Berlekamp, Algebraic Coding Theory, Mc Graw-Hill, 1968.

4. H. Hill, A First Course in Coding Theory, OUP,1986

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	3	1	1	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	2	1	3	1	0	1	1
CO 4	3	3	3	2	3	1	1	1	1
CO 5	3	3	3	3	3	1	2	1	1
TOTAL	15	15	14	10	15	5	6	5	5
SCALED VALUE	3	3	3	2	3	1	2	1	1
0 - No Relation, 1 – Lo	w Relatio	on, 2- Me	dium Re	elation, 3	- High R	elation		1	
1-5→1, 6-10→2, 11-15	5→3								

COUR	SE NA	ME	NEURAL NETWORKS	L	Τ	Р	С				
COUR	SE CO	ODE	YMA1E3	3	0	0	3				
С	P	Α		L	Т	Р	Н				
3	0	0		3	0	0	3				
PRERE	QUISI	TE	Linear algebra								
On succ	essful	comple	tion of this course, the students will be able to:								
			COURSE OUTCOMES	DOMA	IN	LEV	VEL				
CO 1	Sum	marize	different neuron network models	Cognit	ive	Unders	tanding				
CO 2	Exp	ain Per	ceptron Architectures and Learning Rules	Cognit	ive	Unders	tanding				
CO 3	ApplyHebb rule for finding the appropriate weight matrix										
CO 4	Construct back propagation algorithm for the given										
CO 5			e second order Taylor series expansions for the on about the two minima	Cognit	ive	App	Applying				
UNIT 1			Neuron Model and Network Architectur	es		9	hours				
Mathem Network			Model- Network Architectures- Perceptron- es.	Hammin	g Ne	etwork-	Hopfiel				
UNIT 2			Perceptron Architectures			9	hours				
Perceptr	on Arc	hitectu	es and Learning Rule with Proof of Convergence.	. Supervi	sed H	ebbian L	earning				
Linear A	ssocia	tor.									
			Supervised Hebbian Learning			9	hours				
UNIT 3				-Back Pr	opaga	ation - N	Iultilaye				
UNIT 3 The Heb Perceptro		e-Pseuc	lo inverse Rule-Variations of Hebbian Learning								
The Het Perceptre		e-Pseuc	Back Propagation			9	hours				
The Heb Perceptro UNIT 4	on				rfaces						
The Heb Perceptro UNIT 4	on pagati	on Algo	Back Propagation		rfaces						
The Heb Perceptro UNIT 4 Back pro	on pagati	on Algo eries.	Back Propagation	ances Su	rfaces	and Opt					

LECTURE	ECTURE 45 TUTORIAL 0 PRACTICAL 0 TOTAL											
TEXT BOOK												
1.Martin T. Ha	igan, Howard	B. Demuth an	d Mark	Beale, Neural Net	work Des	sign, Vikas I	Publishing					
House, New Delhi,2002.												
REFERENCE	S											
1. James A. Fr	eeman, Davi	d M. Skapura, N	eural Net	tworks Algorithms	, Applicat	ions and Pro	gramming					
Techniques	, Pearson Edu	cation, 2003.										
				~								

2. Robert J. Schalkoff, Artificial Neural Network, McGraw-Hill International Edition, 1997.

COs VS POs

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	3	1	0	1	1
CO 2	3	3	2	1	3	1	0	1	1
CO 3	3	3	3	2	3	1	1	1	1
CO 4	3	3	3	2	3	1	1	1	1
CO 5	3	3	3	2	3	1	1	1	1
TOTAL	15	15	13	8	15	5	3	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1

1 cdot 5 cdot 1, 6 cdot 10 cdot 2, 11 cdot 15 cdot 3

COU	RSE N.	AME		ALC	GEBRA ·	· II	L	Т	P	C
COU	JRSE C	ODE		Ŋ	/MA201		4	1	0	5
С	Р	Α					L	Т	Р	Н
5	0	0					4	1	0	5
PRER	EQUIS	ITE	YMA1	01				1		•
On su	ccessful	comple	etion of t	his course, th	e studen	ts will be able to:				
			COURS	SE OUTCOM	IES		DOMA	IN	LE	VEL
CO 1	Exp	lain the	concepts	s of prime ide	al and M	aximal ideal	Cognit	ive	Under	standing
CO 2	Exp	lain the	concepts	s of splitting f	ïelds		Cognit	ive	Under	standing
CO 3	Exp	lain the	e proof so	lvability by ra	adicals		Cognit	ive	Under	standing
CO 4	Exp	lain the	concepts	s of Galois's I	Extension	IS	Cognit	ive	Under	standing
CO 5	Exp	lain th	e proof	of fundamen	ntal theo	rem of Galois's	Cognit	ive	Under	standing
000	The	ory					Cogint	1.10	Chuch	standing
UNIT	1									15 hours
Prime	ideals ar	nd Maxi	imal Idea	ls, Irreducible	e polynon	nials.				
UNIT	2									15 hours
Classic	cal Form	ulas, Sp	plitting Fi	ields						
UNIT	3									15 hours
The Ga	alois Gro	oup, Ro	ots of Un	ity, Solvabili	ty by Rad	licals.				
UNIT	4									15 hours
Indepe	ndence	of Chara	acters, G	alois Extensio	ons					
UNIT	5									15hours
The Fu	ındamen	tal theo	orem of G	alois theory,	Applicati	ons, Galois Great	Theorem.			
LEC	TURE	6	Г 0	TUTORIAL	15	PRACTICAL	0	TO	ΓAL	75
TEXT	BOOK									
1.Josep	ph Rotm	an, Galo	ois Theor	ry, 2nd edition	n, Springe	er Verlag, 1990.				
UNIT	– I Page	s 31 - 4.	3							
UNIT	– II Pag	es 44 -5	8							
UNIT	– III Pag	ges 59 -	75							
UNIT	– IV Pag	ges 76-8	32							

UNIT – V Pages 83-95

REFERENCES

- 1 DavidS. DummitandRichardM.Foote,AbstractAlgebra,2ndEdition,Wiley StudentEdition, 2008.
- 2. SergeLang. Algebra-Revisedthird edition-Springer-Verlag-2002.
- 3. IanStewart, GaloisTheory, Chapman and Hall, 1973

COs VS POs

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	3	1	0	1	1
CO 2	3	3	2	1	3	1	0	1	1
CO 3	3	3	2	1	3	1	0	1	1
CO 4	3	3	2	1	3	1	0	1	1
CO 5	3	3	2	1	3	1	0	1	1
TOTAL	15	15	15	5	15	5	0	5	5
SCALED VALUE	3	3	3	1	3	1	0	1	1
0 - No Relation, 1 – L	ow Relatio	on, 2- Me	edium Re	elation, 3	- High R	elation	1	1	1
1-5→1, 6-10→2, 11-1	5→3								

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COU	JRSE N.	AME	REAL ANALYSIS - II	L	Т	Р	С				
COU	URSE C	ODE	YMA202	4	1	0	5				
С	Р	Α		L	Т	Р	Н				
5	0	0		4	1	0	5				
PRER	EQUIS	ITE	Basic concepts of convergence and uniform conv	rgence							
On su	ccessful	comple	tion of this course, the students will be able to:								
			COURSE OUTCOMES	DOMA	IN	LEV	VEL				
CO 1	-	lain me ations	ean value theorem and functions of bounded	Cognit	ive	Unders	tanding				
CO 2		npare i grals	mean value theorems for Riemann Stieltjes	Cognit	ive	App	lying				
CO 3	Explain uniform convergence and cognitive Unit differentiation										
CO 4	Exp	Explain directional derivatives and total derivative Cognitive U									
CO 5	Exp theo		verse function theorem and Implicit function	Cognit	ive	Unders	tanding				
UNIT	1					1	15 hours				
Differ	entiation	of sing	gle variable: Derivatives – The chain rule – loca	al extren	na – R	olle's th	neorem -				
Bound	led varia	ation ar	– Taylor's formula – Derivatives of vector – v nd rectifiable curves – Total variation – Fund Change of parameter.								
UNIT	2					1	15 hours				
Riema	inn – S	tieltjesii	ntegral:Definition –linearpropertiesoftheintegral–	Necess	ary co	onditions	for th				
fundaı	nental tl	neorem	nental theorem of Integral calculus -Mean Value of Integral calculus-Change of variable in a Rie mannintegrals.			C					
UNIT						1	15 hours				
Seque	nceandse	eriesoffu	inctions-Pointwiseconvergence-Uniformconverge	ence-							
Unifo	mconve	rgencea	ndintegration–UniformconvergenceandDifferentia	tion-							
C. fr	iontoond	itionato	runiformconvergenceofaseries.								

UNIT 4							15 hours
Functions of Se	veral variable	es – Directional	derivativ	e –Total derivative	– Jacobi	an – Chain 1	rule –Mea
Value Theorem	– Taylor's fo	ormula.					
UNIT 5							15hours
Inverse function	n theorem – Iı	nplicit function	theorem	– Extremum proble	ms with	side conditio	ons.
LECTURE	60	TUTORIAL	15	PRACTICAL	0	TOTAL	75
TEXT BOOK		<u> </u>		11			
1. TomM.Apo	stol, Mathem	aticalAnalysisSo	econdEdi	tion,Narosa Publish	ing Hou	se, NewDelh	ni,1985.
UNIT-I-Chapte	er5 and 6						
UNIT-II-Chapt	er7Section 7.	1-7.22					
UNIT-III- Chap	pter 9Section	9.1 - 9.11 and 9	.14 -9.18				
UNIT-IV-Chap	oter12						
UNIT-V-Chapt	ter13						
REFERENCE	S						
1. WalterRudi	n Dringinlag	of Mathamatical	Analysi	Thind Edition Mo	CrowHil	1 1076	

2. TomApostol,Calculus II,Mc GrawHill,1983.

COs VS POs

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	3	1	0	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	2	1	3	1	0	1	1
CO 4	3	3	2	1	3	1	0	1	1
CO 5	3	3	2	1	3	1	0	1	1
TOTAL	15	15	11	6	15	5	1	5	5
SCALED VALUE	3	3	2	2	3	1	1	1	1

0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation

 $1 ext{-}5 ext{-}1, 6 ext{-}10 ext{-}2, 11 ext{-}15 ext{-}3$

COU	URSE N	AME	PARTIAL DIFFERENTIAL EQUATIONS	L	Т	Р	С	
CO	URSE C	ODE	YMA203	4	1	0	5	
С	Р	A		L	Т	Р	Н	
5	0	0		4	1	0	5	
PREF	REQUIS	ITE	Knowledge in Undergraduate differential equation	ons			I	
On su	ccessful	comple	tion of this course, the students will be able to:					
			COURSE OUTCOMES	DOMA	IN	LEV	VEL	
CO 1	Sun	nmarize	the first order partial differential equations	Cognit	ive	Unders	tanding	
CO 2		·	different methods of Partial Differential f the Second Order	Cognit	ive	Anal	yzing	
CO 3		olythe mation	ethod of variable separable for solving Laplace	Cognit	ive	App	lying	
CO 4			artial differential equations for obtaining general	Cognit	ive	App	Applying	
	solu	tions of	wave equation	U		11	5 0	
CO 5	Util	ize Gree	en's Function for finding solutions of diffusion	Cognit	ive	App	lying	
	equa	ation		- 8		II	5 8	
UNIT	1		Partial Differential Equations of the First O	rder		1	5 hours	
Partial	lDifferer	ntialEqu	ations-OriginsofFirstOrderDifferentialEquations-Originsof	Cauchy's	sProb	lem for f	irst orde	
equati	ons– Lir	near Equ	ations of the first order- Nonlinear partial differe	ntial equ	ation	s of the f	irst orde	
– Cau	chy's mo	ethod of	characteristics - Compatible system of First order	Equation	ons–S	olutions s	satisfying	
given	Conditio	on- Jacol	bi's method.					
UNIT	2		Partial Differential Equations of the Second (Order		1	5 hours	
The O	rigin of	Second	Order Equations – Linear partial Differential Equa	ations w	ith co	nstant co	efficients	
– Equ	ations w	ith varia	ble coefficients - Separation of variables - The	method	of Int	egral Tra	nsforms-	
Non –	linear e	quations	of the second order.					
UNIT	3		Laplace's Equation			1	5 hours	
Eleme	entary so	olutions	of Laplace equation - Families of Equipotenti	al Surfa	ices -	- Bounda	ry value	
proble	ems – Se	eparation	n of variables – Surface Boundary Value Problem	ns – Se	parati	on of Va	riables -	
	me with	Axial S	ymmetry – The Theory of Green's Function for La	aplace E	quatio	on.		
Proble	ins with	i inter o						

The Occurrence of the wave equation in Physics–Elementary Solutions of the One–dimensional Wave equations – Vibrating membrane, Application of the calculus of variations –Three dimensional problem–General solutions of the Wave equation

UNIT 5	The Diffusion Equation								
Elementa	ry Solutions of the Diffusion Equation – Separation of variables – The use of	of Integral							
Transform	ns – The use of Green's functions								

LECTURE	60	TUTORIAL	15	PRACTICAL	0	TOTAL	75
TEXT BOOK							

1.Ian Sneddon, Elements of Partial Differential Equations, McGraw Hill International Book Company, New Delhi, 1983

REFERENCES

- 1. M. D. Raisinghania, Advanced Differential Equations, S. Chand and Company Ltd., New Delhi, 2001.
- K. Sankara Rao, Introduction to Partial Differential Equations, Second edition, Prentice-Hall of India, New Delhi, 2006.
- 3. J. N. Sharma and K. Singh, Partial Differential Equations for Engineers and Scientists, Narosa Publishing House, 2001.

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	3	1	0	1	1
CO 2	3	3	3	3	3	1	2	1	1
CO 3	3	3	3	2	3	1	1	1	1
CO 4	3	3	3	2	3	1	1	1	1
CO 5	3	3	3	2	3	1	1	1	1
TOTAL	15	15	14	10	15	5	5	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1
0 - No Relation, 1 – L	ow Relatio	on, 2- Me	edium Re	elation, 3	- High R	elation	1	ı	1
1-5→1, 6-10→2, 11-1	5→3								

COU	JRSE N.	AME		CLASSIC	CAL DYN	NAMICS	L	Т	C		
COU	JRSE C	ODE		Ŋ	/MA204		4	1	0	5	
С	Р	Α					L	Т	Р	Н	
5	0	0					4	1	0	5	
PRER	EQUIS	ITE	Trigo	phometry and St	atics						
On su	ccessful	comple	etion o	f this course, th	e studen	ts will be able to:					
			COU	RSE OUTCOM	IES		DOMA	IN	LE	VEL	
CO 1	Exp	lain the	mech	anical system, e	nergy and	l momentum.	Cognit	ive	Under	standing	
CO 2Explain Lagrange's equation and integrals of motion.CognitiveUnderst									standing		
CO 3	Exp moti	-	leigh'	s dissipation	function	and impulsive	Cognit	ive	Under	standing	
CO 4	Exp	lain Har	nilton'	s principle and	lamilton'	s equations	Cognit	ive	Under	standing	
CO 5	-	lain Har bi's equ		s Principal Fu	nction, 7	The Hamiltonand	Cognit	ive	Under	standing	
UNIT		or s equ								15 hours	
		oncents	The 1	nechanical syst	em - Ger	eralized Coordina	tes - con	straint			
	y and mo	-		neenamear syst				stramt	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	ar work	
UNIT										15 hours	
		ation: I	Derivat	ion and example	es - Integ	rals of the Motion	- Small o	scillati			
UNIT				1	0					15 hours	
		cations	of Lag	grange's Equati	ons: Ray	leigh's dissipation	functior	ı - im			
_			-	y dependent pot	-	0			•		
UNIT	4									15 hours	
Hamil	ton's equ	ations:	Hamil	ton's principle -	Hamilto	n's equations - Otl	ner variat	ional _l	orincipl	es - phase	
space.						-		-	-	-	
UNIT	5									15hours	
Hamil	Hamilton - Jacobi Theory: Hamilton's Principal Function - The Hamilton - Jacobi's equation -										
Separa	ability.										
LEC	TURE	6	0	TUTORIAL	15	PRACTICAL	0	ТО	TAL	75	
TEXT	BOOK	-						·			

1.Donald T. Greenwood, Classical Dynamics, PHI Pvt. Ltd., New Delhi-1985. UNIT – I Chapter 1: Sections 1.1 to 1.5 UNIT – II Chapter 2: Sections 2.1 to 2.4 UNIT – III Chapter 3 : Sections 3.1 to 3.4 UNIT – IV Chapter 4: Sections 4.1 to 4.4 UNIT – V Chapter 5: Sections 5.1 to 5.3

REFERENCES

1.H. Goldstein, Classical Mechanics, (2nd Edition), Narosa Publishing House, New Delhi.

 Narayan Chandra Rana&PromodSharad Chandra Joag, Classical Mechanics, Tata McGrawHill, 1991.

COs VS POs

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9		
CO 1	3	3	2	1	3	1	0	1	1		
CO 2	3	3	2	1	3	1	0	1	1		
CO 3	3	3	2	1	3	1	0	1	1		
CO 4	3	3	2	1	3	1	0	1	1		
CO 5	3	3	2	1	3	1	0	1	1		
TOTAL	15	15	10	5	15	5	0	5	5		
SCALED VALUE	3	3	2	1	3	1	0	1	1		
0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation											

 $1 ext{-} 5 ext{-} 1, 6 ext{-} 10 ext{-} 2, 11 ext{-} 15 ext{-} 3$

COL	JRSE N	IAME	COMPUTER PROGRAMMING (C++ Theory and Lab)	L	Т	Р	С	
COL	JRSE (CODE	YMA205	3	0	2	5	
С	Р	Α		L	Т	Р	Н	
5	0	0		3	0	2	5	
PRER	EQUI	SITE				I		
On su	ccessfu	l comple	tion of this course, the students will be able to:					
			COURSE OUTCOMES	DOMA	IN	LEV	VEL	
CO1 Explain C programming fundamentals Cognitive Underse								
CO 2	ive	App	lying					
CO 3	Ex	plain ad	vanced concept of pointers and files	Cognit	ive	Unders	tanding	
CO 4	Ex	plain obj	ect oriented technologies	Cognit	ive	Unders	tanding	
CO 5	Ex	plain Al	gorithms Using Functions and Objects	Cognit	ive	Unders	erstanding	
UNIT	1 IN	FRODU	CTION TO C LANGUAGE			1	5 hours	
Lab: 1.Prog 2. Prog 3.Prog UNIT Arrays Functi Array Lab: 4. Prog 5.Prog refe 6.Prog	ram to gram to 2 AF 3 - dy ons - of Stru gram us ram to rence ram to	impleme impleme RAYS , namic ar User def ctures – 5 sing 2D a impleme	o, for statements. nt formatted I/O operations ent formatted I/O operations nt control structures FUNCTIONS, STRUCTURES AND UNIONS ind multi-dimensional arrays - Character arrays ined Functions – Categories of Functions – Recu Structures and Functions rrays nt calling the function through call by value metho nt Structures S AND FILE MANAGEMENT	rsion - S	tructur	String es and	-	
Pointers – Declaration, Accessing a variable, character strings, pointers to functions and struc								
Manag Lab: 7.Prog 8.Prog	ram to ram to	in C – D impleme impleme	nt dynamic memory allocation nt pointer to function nt an array of pointers			i structu	105 - File	

UNIT 4 INTRODU	CTION TO	O C++							15 hours
Overview of C++-C Members-Arrays-Poin Constructor Functions Overloading Lab: 10. Demonstrate Inline 11.Implement Class ar 12. Demonstrate Const	ters-Refere s-Copy Con e Functions ad Subclass tructors & 1	nces-Dyn nstructors- Destructor	amic Default	Allocatio	on- Fu	nction	Overloa	ding-Ov Aember	erloading Operator
UNIT 5 ADDITION	NAL FEAT	URES							15 hours
Inheritance-Base Class Functions-Applying G STL-Overview-Contai Lab: 13. Implement Virtual 14.Programs to implem 15. Program to implem	eneric Fun ner Classes Function nent the co	ctions-Gen s-Lists-Ma ncept of ea	neric Cla ps-Algo	asses-Exc rithms U	ception H sing Fund	andling-	C++ I/O	Streams	-File I/O-
LECTURE 6	-	TORIAL	15	PRA	CTICA	L 0	TO	TAL	75
 Herbert Schildt REFERENCES Deitel and Deit K. N. King, C. edition, 2008 Robert Lafore, 	tel, C How Programmi	to Program ng: A Mo	n, Addis odern Ap	son Wesl	ey , 2011 2nd Editi	on, W. V	· · · · · · · · · · · · · · · · · · ·		mpany; 2
COs VS POs	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	3	1	0	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	2	1	3	1	0	1	1
CO 4	3	3	2	1	3	1	0	1	1
CO 5	3	3	2	1	3	1	0	1	1
TOTAL	15	15	11	6	15	5	1	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1
0 - No Relation, 1 – L 1-5→1, 6-10→2, 11-1		on, 2- Mec	lium Re	elation, 3	- High R	elation	1	I	

COU	JRSE N	AME	FLUID DYNAMICS	L	Т	I	Р	С
COU	JRSE C	ODE	YMA2E1	3	0		0	3
С	Р	Α		L	Т		Р	Н
3	0	0		3	0		0	3
PRER	EQUIS	ITE	Trigonometry					
On su	ccessful	comple	tion of this course, the students will be able to:					
			COURSE OUTCOMES	DOMA	IN		LEV	/EL
CO 1	CO1 Recall the basic concepts of velocity, density and curvilinear co-ordinates. Cognitive Remer							
CO 2	Und	lerstand	the concepts and equations of fluid dynamics	Cogniti	ve	Unc	lersta	nding
	Ana	lyze a	nd understand the concepts of the force	Cogniti	ve	Und	arete	nding
CO 3	-	erienced tational t	by a twodimensional fixed body in a steady flow				lyze	nang
CO 4	Ana	lyze the	approximate solutions of the Navier - Stokes	Cogniti	ve	A	Applying	
CO 4	equa	ation.				Арр	Apprying	
CO 5		•	ppropriate method to solve integral equation of yer, Blasius equation and its series solution	Cogniti	ve	App	Applying	
UNIT	1		Bernoulli's Equation and Equations of Mo	tion			9	hours
Body - condit	– Densit	y – Pres	- Velocity – Stream Lines and Path Lines – Streas sure. Differentiation with respect to the time – Eq cal and physical – Rate of change of linear momen	uation of	f con	tinui	ty – I	Boundary
UNIT	2		Equations of Motion (Contd)				9	hours
Euler's	s mome	ntum Tl	neorem - Conservative forces - Bernoulli's theo	orem in s	teady	y mo	tion	– energy
equation	on for in	viscid f	uid - circulation - Kelvin's theorem - vortex mot	ion – He	lmho	ltz eo	quatio	on.
UNIT 3 Two-Dimensional Motion							9	hours
Two I	Dimensio	onal Mo	tion – Two Dimensional Functions – Complex	Potential	– ba	asic s	singu	larities –
source	– sink	– Vorte	ex - doublet - Circle theorem. Flow past a circ	ular cyli	nder	with	circ	ulation –
Blasiu	s Theore	em – Lif	t force. (Magnus effect)					
UNIT	4		Dynamics of Real Fluids				9	hours
Viscou	us flows	– Navie	r-Stokes equations – Vorticity and circulation in a	viscous	fluid	- Ste	eady	flow

through an arbitrary cylinder under pressure – Steady Couette flow between cylinders in relative motion – Steady flow between parallel planes.

UNIT 5	The Laminar Boundary Layer in Incompressible Flow9hour								
Boundary	/ Layer concept – Boundary Layer equations – Displacement thickness, Momentum	thickness –							
Kinetic e	Kinetic energy thickness – integral equation of boundary layer – flow parallel to semi infinite flat plate –								
Blasius e	quation and its solution in series.								

LECTURE	45	TUTORIAL	0	PRACTICAL	0	TOTAL	45
TEXT BOOKS	5						

- Units I and II: L. M. Milne Thomson, Theoretical Hydro Dynamics, Macmillan Company, 5th Edition (1968). Chapter I : Sections 1.0 – 1.3., 3.10-3.41 (omit 3.32) Chapter III : Sections 3.42 – 3.53 (omit 3.44)
- Units III, IV and V: Modern Fluid Dynamics Volume I, N. Curle and H. J. Davies, D. Van Nostrand Company Limited, London, 1968. Chapter III : Sections 3.1 – 3.7.5 (omit 3.3.4, 3.4, 3.5.2,3.6) Chapter V : Sections 5.2.1–5.3.3 Chapter VI : Sections 6.1 – 6.3.1 (omit 6.2.2., 6.2.5)

REFERENCES

- 1. F. Chorlton, Textbook of Fluid Dynamics, CBS Publishers, New Delhi, 2004.
- A. J. Chorin and A. Marsden, A Mathematical Introduction to Fluid Dynamics, SpringerVerlag, New York, 1993.

E – Resources (MOOC, SWAYAM, NPTEL, Websites etc)

1 https://nptel.ac.in/courses/112/106/112106200/

COs VS POs

PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
3	3	2	1	3	1	0	1	1
3	3	2	1	3	1	0	1	1
3	3	2	1	3	1	0	1	1
3	3	2	1	3	1	0	1	1
3	3	2	1	3	1	0	1	1
15	15	10	5	15	5	0	5	5
3	3	2	1	3	1	0	1	1
	3 3 3 3 3 3 15	3 3 3 3 3 3 3 3 3 3 3 3 15 15	3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 15 15 10	3 3 2 1 3 3 2 1 3 3 2 1 3 3 2 1 3 3 2 1 3 3 2 1 3 3 2 1 3 3 2 1 15 15 10 5	3 3 2 1 3 3 3 2 1 3 3 3 2 1 3 3 3 2 1 3 3 3 2 1 3 3 3 2 1 3 3 3 2 1 3 3 3 2 1 3 15 15 10 5 15	3 3 2 1 3 1 3 3 2 1 3 1 3 3 2 1 3 1 3 3 2 1 3 1 3 3 2 1 3 1 3 3 2 1 3 1 3 3 2 1 3 1 3 3 2 1 3 1 3 3 2 1 3 1 1 3 1 3 1 1 15 15 10 5 15 5	3 3 2 1 3 1 0 3 3 2 1 3 1 0 3 3 2 1 3 1 0 3 3 2 1 3 1 0 3 3 2 1 3 1 0 3 3 2 1 3 1 0 3 3 2 1 3 1 0 3 3 2 1 3 1 0 3 3 2 1 3 1 0 1 3 1 0 5 15 5 0	3 3 2 1 3 1 0 1 3 3 2 1 3 1 0 1 3 3 2 1 3 1 0 1 3 3 2 1 3 1 0 1 3 3 2 1 3 1 0 1 3 3 2 1 3 1 0 1 3 3 2 1 3 1 0 1 3 3 2 1 3 1 0 1 1 3 1 0 1 1 1 1 1 3 1 0 1 1 1 1 1 3 1 0 1 1 1 1 1 15 10 5 15 5 0 5

0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation

1-5→1, 6-10→2, 11-15→3

COU	RSE N	AME	COMBINATORICS	L	Т	Р	С	
COU	RSE C	ODE	YMA2E2	3	0	0	3	
С	Р	Α		L	Т	Р	Н	
3	0	0		3	0	0	3	
PRERI	EQUIS	ITE	Basics of sets					
On suc	cessful	comple	tion of this course, the students will be able to:					
			COURSE OUTCOMES	DOMA	IN	LE	VEL	
CO 1	Exp obje		distributions of distinct objects and non-distinct	Cognit	ive	Under	standing	
CO 2		•	rse counting strategies to solve varied problems rings, combinations, distributions, and partitions	Cognit	ive	App	olying	
CO 3	Solve linear recurrence relations by recognizing							
CO 4		·	e number of permutations with forbidden ing rook polynomials	Cognit	ive	Applying		
CO 5		oly Polya iven obj	's theorem for finding number of permutations ects	Cognit	ive	App	olying	
UNIT 1	L		Permutations and combinations				9 hours	
Distribu	utions o	of distinc	et objects – Distributions of non-distinct objects –	Stirling's	s form	iula.		
UNIT 2	2		Generating functions				9 hours	
Generat	ting fu	nction for	or combinations – Enumerators for permutations	distribu	tions	of distin	ct object	
into noi	n distin	ct cells -	- partitions of integers – Ferrers graphs – Element	ary relati	ons.			
UNIT 3	3		Recurrence relation				9hours	
Linear	recurre	nce relat	ions with constant coefficients- solutions by the to	echnique	of ge	nerating	function	
– A spe	cial cla	ss of no	nlinear difference equations – Recurrence relation	s with tw	o ind	ices.		
UNIT 4	•		The principle of inclusion and exclusion				9 hours	
General	form	ula – F	Permutations with restriction on relative positi	ions – 1	Deran	gements	- Roo	
polynor	nials –	permuta	tions with forbidden positions.					
UNIT 5	5		Polya's theory of counting				9 hours	

Equivalence classes under a permutation group – Burnside theorem – Equivalence classes of functions – Weights and inventories of functions – Polya's fundamental theorem – Generalization of Polya's theorem

LECTURE	45	TUTORIAL	0	PRACTICAL	0	TOTAL	45
TEXT BOOKS	5						

- Cameron, P.J. (1998) Combinatorics: Topics, Techniques, Algorithms. Cambridge: Cambridge University Press.
- Liu, C.L., Eddberg, M. (1968). Solutions to problems in Introduction to Combinatorial Mathematics. New York: McGraw-Hill Book & Co.

REFERENCES

- 1. Liu, C.L. (1968). Introduction of Combinatorial Mathematics. New York: McGraw Hill Book Co.
- Stanley, R.P.(1997). Enumerative Combinatorics, Volume I, Cambridge Studies in Advanced Mathematics, Volume 49. Cambridge University Press.

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	3	1	0	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	3	2	3	1	1	1	1
CO 4	3	3	3	2	3	1	1	1	1
CO 5	3	3	3	2	3	1	1	1	1
TOTAL	15	15	14	9	15	5	4	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1
0 - No Relation, 1 – L	ow Relatio	on, 2- Me	edium Re	elation, 3	- High R	elation	1	1	1

COs VS POs

 $1 - 5 \rightarrow 1, 6 - 10 \rightarrow 2, 11 - 15 \rightarrow 3$

	SE NA	AME	CRYPTOGRAPHY	L	Т	P	C
COUR	RSE C	ODE	YMA2E3	3	0	0	3
C	Р	Α		L	Т	Р	H
3	0	0		3	0	0	3
PRERE	QUIS	ITE	Basic concepts of number theory		1		
On succ	essful	comple	tion of this course, the students will be able to:				
			COURSE OUTCOMES	DOMA	IN	LE	VEL
CO 1		•	concept and properties of modular arithmetic in rithms to find the solution	Cognit	ive	Арј	olying
CO 2			ard's rho method for solving the elliptic curve arithm problem	Cognit	ive	Арј	olying
CO 3			ic properties of finite fields for factoring over finite fields	Cognit	ive	Арј	olying
CO 4	Den ciph		te the concepts of stream ciphers and block	Cognit	ive	Under	standing
CO 5		•	e concepts of public key cryptography, RSA and ve cryptography	Cognit	ive	Apj	olying
UNIT 1				1			9 hours
			ption and Secrecy – The objective of Crypt	tography	- N	umber	Theory
UNIT 2	_						9 hours
Integer f problem		zation p	oroblem – Pollard's rho factoring – Elliptic curve	e factorir	ng – I	Discrete	logarith
							9 hours
UNIT 3	elds –	Basic p	roperties – Arithmetic of polynomials –Factoring	polynon	nials (over fini	te fields
		-					
		torizati	on.				
Finite fie		torizati	on.				9 hours
Finite fio Square f UNIT 4	ree fac		tion – Stream ciphers – Block Ciphers – DES.				9 hours

LECTURE	45	TUTORIAL	0	PRACTICAL	0	TOTAL	45
TEXT BOOKS						1 1	
1. Hans Delfs,	Helmut Kn	ebl, Introduction t	o Crypt	ography, Springer V	erlag, 20	002.	
2. Alfred J. Me	nezes, Paul	l C. Van Oorschot	, Scott A	A. Vanstone, Handbo	ok of A	pplied Cryp	tography
CRC Press, 2	2000.						
,		otography and Netw	work Se	curity, Prentice Hall	of India	ı, 2000.	
3. William Stal	lings, Cryp	otography and Netwo	work Se	curity, Prentice Hall	of India	a, 2000.	
3. William Stal	lings, Cryp			curity, Prentice Hall Security, PHI Learnin			ni, 2009
 William Stal REFERENCES Pachghare V 	lings, Cryp .K., Crypto	ography and Inform	nation S		ng Pvt. I	td., New Dell	

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	3	1	1	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	3	2	3	1	1	1	1
CO 4	3	3	2	1	3	1	0	1	1
CO 5	3	3	3	2	3	1	1	1	1
TOTAL	15	15	14	9	15	5	4	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1
0 - No Relation, 1 – L	ow Relatio	on, 2- Me	edium Re	elation, 3	- High R	elation	<u> </u>	1	1
1-5→1, 6-10→2, 11-1	5→3								

COU	RSE N.	AME	TOPOLOGY	L	Т	P	C		
COU	RSE C	ODE	YMA301	4	1	0	5		
С	Р	A		L	Т	Р	Н		
5	0	0		4	1	0	5		
PRER	EQUIS	ITE	Basic concepts of sets						
On suc	cessful	comple	tion of this course, the students will be able to:						
			COURSE OUTCOMES	DOMA	IN	LE	VEL		
CO 1	Ider not	ntify wh	ether a given family of subsets is a topology or	Cognit	ive	App	lying		
CO 2		-	concepts of continuous function on product d metric topology	Cognit	ive	App	lying		
CO 3	-	lain th	Cognit	ive	Understanding				
CO 4	-	lain the	ain the concepts of limit point compactness and local Cognitive Un						
CO 5	prov	•	•	Cognit	ive	App	lying		
UNIT	1		Topological Spaces]	15 hours		
-	gical sp ce topol		Basis for a topology - The order topology - The p	roduct to	polog	y on X x	x Y - The		
UNIT	2		Continuous Functions]	15 hours		
Closed	sets an	d limit	points-Continuous functions - the product topolo	gy - The	metr	ic topolo	ogy - The		
metric	topolog	y (conti	nued) - Uniform limit theorem.						
UNIT	3		Connectedness			1	15 hours		
Connec	ted spa	ces - co	nnected subspaces of the Real line - Components a	and local	conne	ectedness	5.		
UNIT	4		Compactness]	15 hours		
Compa	ct space	es - com	pact subspaces of the Real line - Limit Point Com	pactness	– Loc	al Comp	actness.		
UNIT :	5		Countability and Separation Axiom			1	15hours		

Urysohnmetriza	tion Theore	em - The Tietz exte	ension the	heorem			
LECTURE	60	TUTORIAL	15	PRACTICAL	0	TOTAL	75
TEXT BOOK							
1.James R. Mun	kres, "Topo	ology", (2nd Editio	on) PHI	Learning Pvt. Ltd.,	(Third I	ndian Reprint)	
NewDelhi,2014							
Unit I - Chapter	2: Sections	12 to 17					
Unit II - Chapter	2: Section	s 18 to 21 (Omit S	ection 2	22)			
Unit III - Chapte	er 3: Section	ns 23 to25					
Unit IV - Chapte	er 3: Section	ns 26 to29					
Unit V - Chapter	4: Section	s 30 to 35					
REFERENCES	5						
1. J. Dugundji,	"Topology	", Prentice Hall of	India, 1	New Delhi,1975.			
2. George F. S	immons, "	Introduction to Te	opology	and Modern Analy	ysis", M	lcGraw Hill E	Book Co.
1963.							
3. J.L. Kelly, "	General To	pology", Van Nos	trand, R	einhold Co., NewYo	ork.1995	5	
4. L.Steen and	J.Subhasł	n, "Counter Exar	nples in	n Topology", Holt,	Rineha	art and Winst	ton, Nev

5. S.Willard, "General Topology", Addison - Wesley, Mas. 1970.

3 3 3	3 3 3	2 2	3 3	1	1	1	1
-			3	1	1	1	-
3	3	2				1	1
	5	2	3	1	1	1	1
3	2	1	3	1	0	1	1
3	3	2	3	1	1	1	1
15	14	9	15	5	4	5	5
3	3	2	3	1	1	1	1
ion, 2- M	edium Ro	elation, 3	- High R	elation	<u>I</u>	1	<u>I</u>
	3 15 3	3 3 15 14 3 3	3 3 2 15 14 9 3 3 2	3 3 2 3 15 14 9 15 3 3 2 3	3 3 2 3 1 15 14 9 15 5	3 3 2 3 1 1 15 14 9 15 5 4 3 3 2 3 1 1	3 3 2 3 1 1 15 14 9 15 5 4 5 3 3 2 3 1 1 1

COUR	SE NA	ME	INTEGRAL EQUATIONS, CALCULUS OF	L	Т	Р	С	
			VARIATIONS AND TRANSFORMS					
COUR	SE CO	DE	YMA302	4	1	0	5	
С	P	Α		L	Т	Р	Н	
5	0	0		4	1	0	5	
PRERE	QUISI	ГЕ	Multivariable calculus and vector calculus	1	1			
On succ	essful c	omple	tion of this course, the students will be able to:					
			COURSE OUTCOMES	DOMA	IN	LEV	VEL	
CO 1	Ident	ify ma	xima and minima of functionals	Cognit	ive	App	lying	
CO 2	Utiliz proble		rier transform for solving boundary value	Cognit	ive	Appl	lying	
CO 3	Solve	Besse	function integrals over a finite interval	Cognit	ive	Applying		
CO 4			envalues and eigenfunction of the homogeneous ations with degenerate kernels	Cognit	ive	Applying		
CO 5			ra integral equation and Fredholm integral using method of successive approximations	Cognit	ive	Applying		
UNIT 1						1	5 hours	
Calculus	of var	iations	- Maxima and Minima - the simplest case - N	Vatural b	oound	ary and t	ransition	
condition	ns - var	iationa	l notation – more general case – constraints and L	agrange	's mul	tipliers –	variable	
end point	ts – Stu	rm-Lio	ouville problems					
UNIT 2						1	5hours	
	s - Fin	ite Fo	Fourier sine and cosine transforms - Properties arier transform - Finite Fourier sine and cosine entity					
UNIT 3						1	5 hours	
Hankel 7	F ransfo	orm : 1	Definition – Inverse formula – Some important	results	for I	Bessel fu	nction –	
Linearity	prope	erty –	Hankel Transform of the derivatives of the fu	unction	–Hanl	kel Trans	sform of	
differenti	al oper	ators –	Parseval's Theorem					
UNIT 4						1	5hours	
Linear In	tegral l	Equatio	ons - Definition, Regularity conditions – special ki	nd of ke	rnels	–eigen va	alues and	

eigen functions – convolution Integral – the inner and scalar product of two functions – Notation – reduction to a system of Algebraic equations – examples– Fredholm alternative - examples – an approximate method.

UNIT 515hoursMethod of successive approximations: Iterative scheme – examples – Volterra Integral equation –
examples – some results about the resolvent kernel. Classical Fredholm Theory: the method of solution
of Fredholm – Fredholm's first theorem – second theorem – third theorem

LECTURE	60	TUTORIAL	15	PRACTICAL	0	TOTAL	75
TEXT BOOKS	5						

1. Ram.P.Kanwal – Linear Integral Equations Theory and Practice, Academic Press 1971.

2. F.B. Hildebrand, Methods of Applied Mathematics II ed. PHI, ND 1972.

3. A.R. Vasishtha, R.K. Gupta, Integral Transforms, Krishna Prakashan Media Pvt Ltd, India, 2002.

UNIT – I Chapter 2: Sections 2.1 to 2.9 of [2]

- UNIT II Chapter 7 of [3]
- UNIT III Chapter 9 of [3];
- UNIT IV -Chapters 1 and 2 of [1]
- UNIT V Chapters 3 and 4 of [1]

REFERENCES

1. S.J. Mikhlin, Linear Integral Equations (translated from Russian), Hindustan Book Agency, 1960.

2. I.N. Snedden, Mixed Boundary Value Problems in Potential Theory, North Holland, 1966.

COs VS POs

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	3	1	1	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	3	2	3	1	1	1	1
CO 4	3	3	3	2	3	1	1	1	1
CO 5	3	3	3	2	3	1	1	1	1
TOTAL	15	15	15	10	15	5	5	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1
0 - No Relation, 1 – L	ow Relatio	on, 2- Me	edium Re	elation, 3	- High R	elation	1	1	1

 $1 ext{-} 5 ext{-} 1, 6 ext{-} 10 ext{-} 2, 11 ext{-} 15 ext{-} 3$

COU	RSE N.	AME		FUNCTIO	NAL AN	ALYSIS	L	Т	P	C
COU	RSE C	ODE		Ŋ	(MA303		4	1	0	5
С	Р	Α					L	Т	Р	Н
5	0	0					4	1	0	5
PRER	EQUIS	ITE	Basic	concepts of alg	gebra					
On suc	ccessful	comple	etion of	this course, th	e studen	ts will be able to:				
			COUR	RSE OUTCOM	IES		DOMA	IN	LE	VEL
CO 1	Exp	lain No	rmed S	paces and Hahr	n – Banac	h Theorems	Cogniti	ve 1	Underst	anding
CO 2	Exp	lain Clo	osed Gr	aph and Open I	Mapping	Theorems	Cogniti	ve 1	Underst	anding
CO 3	-	lain B nded Op		Inverse The	orem –	Spectrum of a	Cogniti	ve 1	Underst	anding
CO 4	_	lain Int	ner Pro	oduct Spaces a	and Ries	z Representation	Cogniti	ve 1	Underst	anding
CO 5	Exp	lain Bo	unded (Operators and S	elf-adjoi	nt Operators	Cogniti	ve 1	Underst	anding
UNIT	1									15 hours
Norme	d Space	s – Con	tinued of	of Linear Maps	– Hahn -	- Banach Theorem	S			
UNIT	2									15 hours
Banach	n Spaces	s – Unifo	orm Bo	undedness Prin	ciple – C	losed Graph and O	pen Map	ping T	heoren	ns
UNIT	3									15 hours
Bound	ed Inver	se Theo	orem – S	Spectrum of a E	Bounded (Operator				
UNIT	4									15 hours
Inner F	Product S	Spaces -	- Ortho	normal Sets – H	Projection	and Riesz Repres	entation 7	Theore	ms	
UNIT	5									15hours
Bound	ed Oper	ators an	d adjoi	nt, Normal , Un	itary and	Self-adjoint Opera	ators			
LEC	ΓURE	6	0	TUTORIAL	15	PRACTICAL	0	TO	TAL	75
TEXT	BOOK							-		
1.Balm	iohan V	/ Lima	ye, "Fı	unctional Anal	ysis", 31	d Edition, New	Age Inte	ernatic	nal (P)) Limited
Publish	ners, Ne	w Delhi	, 2017							
REFE	RENCE	ES								
1. G.H	F.Simmo	ons,"Inti	roductio	on to Topology	y and M	odern Analysis",N	IcGraw I	Hill In	ternatio	onal Book

Company, New York, 1963.

- 2. W. Rudin, "Functional Analysis", Tata McGraw-Hill Publishing Company, New Delhi, 1973.
- 3. E. Kreyszig, "Introductory Functional Analysis with Applications", John Wiley & Sons, New York, 1978.
- 4. H. C. Goffman and G.Fedrick, "First Course in Functional Analysis", Prentice Hall of India, New Delhi, 1987

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	3	1	0	1	1
CO 2	3	3	2	1	3	1	0	1	1
CO 3	3	3	2	1	3	1	0	1	1
CO 4	3	3	2	1	3	1	0	1	1
CO 5	3	3	2	1	3	1	0	1	1
TOTAL	15	15	10	5	15	5	0	5	5
SCALED VALUE	3	3	2	1	3	1	0	1	1
0 - No Relation, 1 – Lov	w Relatio	on, 2- Me	dium Re	elation, 3	- High R	elation			

CO 1Identify inCO 2Explain thCO 2Explain thCO 3Identify GSurfaces oSurfaces oCO 4Explain nCO 5Explain cUNIT 1IDefinition of SpaceContact between currFundamental ExisterIUNIT 2IDefinition of surfaceCoefficients - FamilyCanonical geodesic ofIUNIT 3INormal property ofBonnet theorem - Gamapping.UNIT 4ISecond fundamental	CODE YMA304	L	Т	P	С	
50PREREULISITEOn successful compOn successful compCO 1Identify inCO 2Explain ofCO 4Explain ofCO 4Explain ofCO 4Explain ofCO 5Explain ofCo for colspan="2"Co for colspan="2" <td co<="" td=""><th></th><td>4</td><td>1</td><td>0</td><th>5</th></td>	<th></th> <td>4</td> <td>1</td> <td>0</td> <th>5</th>		4	1	0	5
PREREUISITE On successful comp CO 1 CO 2 CO 2 CO 3 CO 4 CO 4 CO 5 CO 4 CO 5 CO 5 CO 5 CO 4 CO 5 CO 4 CO 5 CO 5 CO 4 CO 5 CO 5 CO 4 CO 5 CO 4 CO 5 CO 5 CO 4 CO 5	A	L	Т	Р	Н	
On successful compCO 1Identify inCO 2Explain thCO 2Explain thCO 3Identify GSurfaces oSurfaces oCO 4Explain nCO 5Explain cUNIT 1IDefinition of Spacecontact between curFundamental ExisterUNIT 2Definition of surfacecoefficients - FamilCanonical geodesic ofUNIT 3Normal property ofBonnet theorem - Gamapping.UNIT 4Second fundamental	0	4	1	0	5	
CO 1Identify inCO 2Explain theCO 2Explain theCO 3Identify GSurfaces ofSurfaces ofCO 4Explain nCO 5Explain cUNIT 1Image: Contact between curreDefinition of SpaceContact between curreFundamental ExisterImage: Contact between curreUNIT 2Image: Contact between curreUNIT 2Image: Contact between curreContact between curreImage: Contact between curreFundamental ExisterImage: Contact between curreUNIT 2Image: Contact between curreImage: Contact between curreImage: Contact between curreNormal property ofImage: Contact between curreNormal property ofImage: Contact between curreImage: Contact between curreImage: Contact between curreUNIT 3Image: Contact between curreImage: Contact between curre	ISITE Multivariable Calculus and Vector Calculus				1	
CO 2Explain the fermionicalCO 3Identify Surfaces of Surfaces of Surfaces of Explain in Explain in CO 5CO 4Explain in Explain coCO 5Explain in CoUNIT 1IDefinition of Space contact between curre Fundamental ExisterUNIT 2IDefinition of Surface coefficients - Family Canonical geodesice of UNIT 3Normal property of Bonnet theorem - Ga mapping.UNIT 4Second fundamental	ful completion of this course, the students will be able to:					
CO 2Explain the fermionicalCO 3Identify Surfaces of Surfaces of Surfaces of Explain in Explain in CO 5CO 4Explain in Explain coCO 5Explain in CoUNIT 1IDefinition of Space contact between curre Fundamental ExisterUNIT 2IDefinition of Surface coefficients - Family Canonical geodesice of UNIT 3Normal property of Bonnet theorem - Ga mapping.UNIT 4Second fundamental	COURSE OUTCOMES	DOMA	IN	LE	VEL	
IdentifyGCO 3IdentifyGSurfaces oCO 4Explain nCO 5Explain cUNIT 1Image: Contact between currerDefinition of Spacecontact between currerFundamental ExisterUNIT 2Definition of surfacecoefficients - FamilCanonical geodesic ofUNIT 3Normal property ofBonnet theorem - Gamapping.UNIT 4Second fundamental	dentify involutes and evolutes of a given curve	Cognitiv	ve	Applyin	g	
CO 3Surfaces ofCO 4Explain nCO 5Explain cUNIT 1Image: Contact between curred of the second contact between curred of the second second coefficients - Family Canonical geodesic of the second second coefficients - Family Canonical geodesic of the second s	Explain the concept of Helicoids and Families of curves	Cognitiv	ve	Underst	anding	
CO 5Explain cUNIT 1Definition of Spacecontact between curreFundamental ExisterUNIT 2Definition of surfacecoefficients - FamilyCanonical geodesic ofUNIT 3Normal property ofBonnet theorem - Gamapping.UNIT 4Second fundamental	dentify Geodesic curvature, Gaussian curvature and urfaces of constant curvature of a given curve	Cognitiv	ve	Applyin	g	
UNIT 1 Definition of Space contact between cur Fundamental Exister UNIT 2 Definition of surface coefficients - Famil Canonical geodesic e UNIT 3 Normal property of Bonnet theorem - Gamapping. UNIT 4 Second fundamental	Explain non intrinsic properties of a surface	Cognitiv	ve	Underst	anding	
Definition of Space contact between cur Fundamental Exister UNIT 2 Definition of surface coefficients - Famil Canonical geodesic e UNIT 3 Normal property of Bonnet theorem - Ga mapping. UNIT 4	Explain compact surface and complete surface	Cognitiv	ve	Underst	anding	
contact between curFundamental ExisterUNIT 2Definition of surfacecoefficients - FamilCanonical geodesic eUNIT 3Normal property ofBonnet theorem - Gamapping.UNIT 4Second fundamental	SPACE CURVES				15 hours	
UNIT 3 Normal property of Bonnet theorem - Ga mapping. UNIT 4 Second fundamental	al Existence Theorem for space curves – Helics. INTRINSIC PROPERTIES OF A SURFA of surface - Curves on a surface - Surfaces of revolution – - Families of curves - Isometric correspondence - Intr	CE Helicoic	ls –]	Metric -	15 hours Direction	
Normal property of Bonnet theorem - Ga mapping. UNIT 4 Second fundamental	GEODESICS			T	15 hours	
Second fundamental	perty of geodesic - Existence theorems - Geodesic parallel			curvatur	e - Gauss	
	orem - Gaussian curvature - Surfaces of constant curvature -	FACE			15hours	
ruled surfaces - Fund	orem - Gaussian curvature - Surfaces of constant curvature - NON INTRINSIC PROPERTIES OF A SUR		pabl		-	
UNIT 5 Compact surfaces w		surfaces- ces.	- Mir		faces and 15 hours	

or mean curvature- Complete surfaces- Characterization of complete surfaces- Hilbert's theorem-Conjugate points on geodesics.

LECTURE	60	TUTORIAL	15	PRACTICAL	0	TOTAL	75

TEXT BOOK

1.T. J. Wilmore, "An introduction to Differential Geometry", Oxford University Press, 1997. **REFERENCES**

- 1. Do Carmo, "Geometry of curves and surfaces", Academic Press, 2017.
- 2. D.Somasundaram, "Differential Geometry", Narosa Publ. House, Chennai, 2005.
- 3. J.A.Thorpe, "Elementary Topics in Differential Geometry", Springer Verlag, New York, 1979.

COs VS POs

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	3	1	1	1	1
CO 2	3	3	2	1	3	1	0	1	1
CO 3	3	3	3	2	3	1	1	1	1
CO 4	3	3	2	1	3	1	0	1	1
CO 5	3	3	2	1	3	1	0	1	1
TOTAL	15	15	12	7	15	5	2	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1

0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation

 $1 ext{-} 5 ext{-} 1, 6 ext{-} 10 ext{-} 2, 11 ext{-} 15 ext{-} 3$

	URSE N	AME		COMPL	EX ANALYSIS	L	Т	Р	C
COU	URSE C	ODE		Y	(MA305	4	1	0	5
С	Р	Α				L	Т	Р	Н
5	0	0				4	1	0	5
PRER	REQUIS	ITE	Basic	c concepts of rea	al numbers	I			
On su	ccessful	comple	etion o	f this course, th	e students will be able to):			
			COU	RSE OUTCOM	IES	DOMA	IN	LE	VEL
CO 1	Exp	lain Ca	uchy's	Theorem for re	ctangle and disc	Cognit	ive	Unders	standing
CO 2		•	•	ntegral formula order derivative	and Taylor's theorem fo	r Cognit	ive	App	lying
CO 3	Exp regi		cally 1	Exact Differenti	als – Multiply Connected	d Cognit	ive	Арр	lying
CO 4			e give	n definite integra	als using Cauchy' theorem	n Cognit	ive	Anal	yzing
CO 5			•	Series and the the given prob	Laurent Series for finding	^g Cognit	ive	App	lying
UNIT		1							15 hours
Cauch	y's The			rc – Line integ	rals as functions of arc-	Cauchy's	Theor		
UNIT									15 hours
		•		0	- Higher derivatives – Ro		singul	arities –	Taylor'
		os and P	oles –	The Local Map	ping – The Maximum Prin	nciple			
UNIT									15 hours
	a and Cr	vcles – S	imple	Connectivity – 1	Homology – The General			•	heorem
Chain	-		eorem ·	– Locally Exact	Differentials – Multiply C	Connected	Regio	10	
Chain Proof	of Cauc		eorem -	– Locally Exact	Differentials – Multiply C	Connected	Regio		15 hours
Chain Proof UNIT	of Cauc	hy's The			Differentials – Multiply C				
Chain Proof UNIT The R	of Caucl	hy's The	– The	Argument Princ		nite Integra			
Chain Proof UNIT The R proper	of Caucl 4 esidue T rty – Poi	hy's The	– The	Argument Princ	ciple – Evaluation of Defin	nite Integra		he Mear	ı – value
Chain Proof UNIT The R proper UNIT	of Cauch 4 esidue T rty – Poi	hy's The heorem sson's fe	– The ormula	Argument Princ - Schwarz's The	ciple – Evaluation of Defin	nite Integra	ıls – T	he Mean	n – value 15hours
Chain Proof UNIT The R proper UNIT Weier	of Cauch 4 esidue T rty – Poi	hy's The heorem sson's fe Theoren	– The ormula	Argument Princ - Schwarz's The	ciple – Evaluation of Define eorem – The Reflection Pr	nite Integra	ıls – T	he Mean	n – value 15hours
Chain Proof UNIT The R proper UNIT Weier Hadan	of Cauch 4 esidue T rty – Poi 5 strass's	hy's The heorem sson's fe Theoren	– The ormula n – The	Argument Princ - Schwarz's The	ciple – Evaluation of Define eorem – The Reflection Pr	nite Integra inciple rtial Fractio	uls – T ons- Je	he Mean	15hours

TEXT BOOK

1.LarsV.Ahlfors, "Complex Analysis", 3rd Edition McGraw Hill Education (India) Private Ltd.2013. Chapter 4 - Section 1.1 to 1.5, Section 2.1 to 2.3, Section 3.1 to 3.4, Section 4.1 to 4.7, Section 5.1 to 5.3, Section 6.1 to 6.5. Chapter 5 - Section 1.1 to 1.3, Section 2.1, Section 3.1 & 3.2.

REFERENCE

1.S. Ponnusamy, "Complex Analysis", Alpha Science International Ltd; 2nd Revised edition, 2005

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	3	1	0	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	3	2	3	1	1	1	1
CO 4	3	3	3	3	3	1	2	1	1
CO 5	3	3	3	2	3	1	1	1	1
TOTAL	15	15	14	10	15	5	5	5	5
SCALED VALUE	3	3	3	2	3	1	1	1	1
0 - No Relation, 1 – Le	ow Relatio	on, 2- Me	dium Re	lation, 3	- High R	elation	1		I

s will be able to: for constructing	3 L 3 DOMA Cognitive Cognitive	T] 0 0	0 3 P F 0 3			
for constructing	3 DOMA Cognitiv		0 3			
for constructing	DOMA					
for constructing	Cognitiv		LEVEL			
for constructing	Cognitiv		LEVEL			
	Cognitiv		LEVEL			
		ve A				
n analysis with	Cognitiv		Applying			
	Coginti	ve Uno	derstandi			
l Death queues	Cognitiv	ve A	Applying			
G/M/1 Queues	Cognitiv	Cognitive An				
nd First Passage	Cognitiv	Cognitive Ev				
arkov Models			9hour			
Analysis, Occupar	ncy Time	s, Limiting	g Behavi			
kov Models			9 hou			
Process, Examples	and Long	g-term Ana	alysis.			
Iodels			9 hou			
hadle are seen total	Finite and	l Infinite C	Capacity.			
Death queues with			9 hou			
leath queues with I						
			9 hou			
ls (Contd)		TOTAI	45			
ls (Contd) Iotion	0					
e V		_				

REFERENCES

- 1. J. Medhi, Stochastic Processes, New Age, 2009.
- 2. S. M. Ross, Stochastic Processes, Wiley Series in Probability and Statistics, 1996

COs VS POs

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9			
CO 1	3	3	3	2	3	1	1	1	1			
CO 2	3	3	2	1	3	1	0	1	1			
CO 3	3	3	3	2	3	1	1	1	1			
CO 4	3	3	3	3	3	1	2	1	1			
CO 5	3	3	3	3	3	1	3	1	1			
TOTAL	15	15	14	11	15	5	7	5	5			
SCALED VALUE	3	3	3	3	3	1	2	1	1			
0 - No Relation, 1 – L	0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation											

1-5→1, 6-10→2, 11-15→3

COU	JRSE N	AME	MATHEMATICAL MODELING	L	Т	Р	C
COL	JRSE C	ODE	YMA3E2	3	0	0	3
С	Р	A		L	Т	Р	Н
3	0	0		3	0	0	3
PRER	EQUIS	ITE	YMA103				1
On su	ccessful	comple	tion of this course, the students will be able to:				
			COURSE OUTCOMES	DOMA	IN	LEV	VEL
CO 1		-	nodels that can be constructed by ordinary equations of first order under study	Cognit	ive	App	lying
CO 2			partment models to solve the problems involved s and medicine	Cognit	ive	App	lying
CO 3		·	athematical models that can be developed by r linear differential equations	Cognit	ive	Anal	yzing
CO 4		-	ar difference equation to solve problems in economics	Cognit	ive	App	lying
CO 5		·	e solutions of the given problems that can be ough graphs	Cognit	ive	App	lying
UNIT	1 M	athema	tical Modeling through Ordinary Differential F	Equation	s of F	irst 9) hours
			order				
Linear	Growth	n and De	ecay Models – Non-Linear Growth and Decay M	Iodels –	Compa	rtment]	Models -
Dynan	nics prol	blems –	Geometrical problems				
UNIT	2 Ma	themati	cal Modeling through Systems of OrdinaryDiff	ferential	Equa	tions 9	hours
			of First Order				
Popula	ation Dy	namics -	- Epidemics - Compartment Models - Economics	-Medic	ine, A	rms Rac	e, Battle
and In	ternation	nal Trad	e – Dynamics				
UNIT	3 Ma	athemat	ical Modeling through Ordinary Differential E	quations	of Sec	ond 9) hours
			Order				
Planeta	ary Mot	ions – C	ircular Motion and Motion of Satellites - Mathem	natical M	Iodelir	ng throug	gh Linea
Differe	ential Ec	quations	of Second Order –Miscellaneous Mathematical M	odels			
UNIT	4		Mathematical Modeling through Difference Eq	uations		9) hours

Simple Models – Basic Theory of Linear Difference Equations with ConstantCoefficients – Economics and Finance – Population Dynamics and Genetics – Probability Theory UNIT 5 **Mathematical Modeling through Graphs** 9 hours Solutions that can be Modeled through Graphs - Mathematical ModelinginTerms of Directed Graphs, Signed Graphs, Weighted Digraphs and UnorientedGraphs LECTURE 45 TUTORIAL 0 PRACTICAL 0 TOTAL 45 **TEXT BOOK** 1.J.N. Kapur, Mathematical Modeling, Wiley Eastern Limited, New Delhi, 1988 REFERENCE 1.J. N. Kapur, Mathematical Models in Biology and Medicine, Affiliated East -West Press Pvt Limited, New Delhi, 19

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	3	1	1	1	1
CO 2	3	3	3	2	3	1	1	1	1
CO 3	3	3	3	3	3	1	2	1	1
CO 4	3	3	3	2	3	1	1	1	1
CO 5	3	3	3	2	3	1	1	1	1
TOTAL	15	15	15	11	15	5	6	5	5
SCALED VALUE	3	3	3	3	3	1	2	1	1
0 - No Relation, 1 – L	ow Relatio	on, 2- Me	edium Re	elation, 3	- High R	elation	1	1	1
1-5→1, 6-10→2, 11-1	5→3								

COU	RSE N	AME	DATA ANALYSIS USIN	G SPSS	L	Т	Р	C	
COU	IRSE C	ODE	YMA3E3		3	0	0	3	
С	Р	A			L	Т	Р	Н	
3	0	0			3	0	0	3	
PRER	EQUIS	SITE	Probability and Statistics		1			I	
On su	ccessfu	l compl	tion of this course, the students	will be able to):				
			OURSE OUTCOMES		DOMA	IN	LE	VEL	
CO 1	-		ic concepts of SPSS, working w lotting of Charts using Bar and P		Cogniti	ve	Unders	standing	
CO 2	-		asures of central tendencies and sing SPSS		Understan	ding	Unders	tanding	
CO 3	sign	nificance	cept of testing hypothesis level for the given data using or dent sample t-test and paired t-te	ne sample t-	Cogniti	ve	App	lying	
CO 4			way ANOVA, two-way ANOV or the given data in SPSS	A and Chi-	Cogniti	ve	App	lying	
CO 5		-	e relationship for the datausing nd regression in SPSS	methods of	Cogniti	ve	App	lying	
UNIT	1			·		·	9	9 hours	
Introd	uction t	o SPSS	- Starting SPSS – SPSS Main N	Menus – Work	ing with t	the Data	a Editor	- SPSS	
Viewe	r – Imp	orting a	d Exporting data. Plotting of Ch	arts: Simple Ba	ar diagram	n, Multij	ple Bar	Diagram	
and Pi	e Diagra	am.							
UNIT	2						-	9 hours	
Descri	ptive S	tatistics	nd Frequencies using SPSS. M	easures of cen	tral tende	ncies: A	rithmet	tic mean,	
Media	Median, Mode, Geometric mean and Harmonic Mean. Measures of Dispersion: Range, inter quartile								
range, Mean Deviation and Standard deviation. Measures of Skewness and Kurtosis.									
UNIT	3						9	9 hours	
Testin	g of Hy	pothesis	Type I error and Type II Errors	– Concept of p	p values –	Basic (Concept	s of One	
Sampl	e t-test,	Indepen	lent Samples t-test, Paired sample	es t-test using S	SPSS with	interpre	etation.		
UNIT	4						9	9 hours	

 Analysis of Variance: Basic concepts of ANOVA – One Way and Two-Way ANOVA using SPSS with interpretation. Chi-square Test for Independence of attributes using SPSS.

 UNIT 5
 9 hours

 Correlation: Karl Pearson's coefficient of Correlation – Spearman's Rank correlation – Simple linear

Regression using SPSS with interpretation.

LECTURE	45	TUTORIAL	0	PRACTICAL	0	TOTAL	45
TEXT BOOK							

1.Ajai J Gaur and Sanjay S. Gaur (2008): Statistical Methods for Practice and Research: A guide to data analysis using SPSS, First Edition, Sage Publications

REFERENCES

- 1. Andy Field.(2011); Discovering Statistics Using SPSS, Sage Publications.
- 2. Hinton P R, Brownlow C, McMurray, I. and Cozens, B. (2004) SPSS Explained, Routledge

COs VS POs

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	
CO 1	3	3	2	1	3	1	0	1	1	
CO 2	3	3	2	1	3	1	0	1	1	
CO 3	3	3	3	2	3	1	1	1	1	
CO 4	3	3	3	2	3	1	1	1	1	
CO 5	3	3	3	2	3	1	1	1	1	
TOTAL	15	15	13	8	15	5	3	5	5	
SCALED VALUE	3	3	3	2	3	1	1	1	1	
0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation										

 $1 - 5 \rightarrow 1, 6 - 10 \rightarrow 2, 11 - 15 \rightarrow 3$

4.a. Curriculum and Syllabus of B.Sc Mathematics - After Revision

BACHELOR OFSCIENCE (THREE YEAR - FULL TIME)

REGULATION - 2023

SEMESTER - I

Part	Category	Course Code	Course Name	L	Т	Р	SS	Η	С
Ι	Language	XGT101	Tamil – I	3	0	0	0	3	3
II	Language	XGE102	English – I	3	0	0	0	3	3
III	Core - 1	XMT103	Algebra & Trigonometry	3	1	0	0	4	4
	Core - 2	XMT104	Differential Calculus	3	1	0	0	4	4
	Allied–1	XPG105	Allied Physics - I	2	1	0	0	4	3
	(GE)								
	Allied–1	XPG106	Allied Physics Practical - I	0	0	2	0	2	1
	(GE)								
IV	FC	XMT107	Foundation Course-Bridge Course	1	1	0	0	2	2
	UMAN - 1	XUM001	Human Ethics, Values, Rights and	1	0	0	1	1	1
			Gender Equality						
			Total	16	4	2	1	23	21

SEMESTER - II

Ι	Language	XGT201	Tamil – II	3	0	0	0	3	3
II	Language	XGE202	English – II	3	0	0	0	3	3
III	Core – 3	XMT203	Analytical Geometry 3-D and	3	1	0	0	4	4
			Integral Calculus						
	Core – 4	XMT204	Sequence and Series	3	1	0	0	4	4
	Allied- 2	XPG205	Allied Physics - II	2	1	0	0	3	3
	GE)								
	Allied- 2	XPG206	Allied Physics Practical - II	0	0	2	0	2	1
	GE)								
	SEC – 1	XMT207	Quantitative Aptitude – I	1	1	0	0	2	2
IV	UMAN - 2	XUM002	Environmental Studies	1	0	0	1	1	1
			Field Visit	0	0	0	0	0	2
			Total	16	4	2	1	22	23

SEMESTER - III

Ι	Language	XGT301	Tamil – III	3	0	0	0	3	3
II	Language	XGE302	English – III	3	0	0	0	3	3
III	Core – 5	XMT303	Differential Equations and	3	1	0	0	4	4
			Applications						
	Core – 6	XMT304	Vector Calculus and Applications	3	1	0	0	4	4
	Allied – 3	XMT305	Statistics for Data Science - I	2	1	0	0	3	3
	(DSC)								
	Allied – 3	XMT306	Statistics for Data Science - I - Lab	0	0	2	0	2	1
	(DSC)		using R-Programming						
	SEC - 2	XMT307	Quantitative Aptitude - II	1	1	0	0	2	2
IV	GE: Open		Open Elective- I	3	0	0	0	3	3
	Elective								
	UMAN -3	XUM003	Disaster Management	1	0	0	1	1	1
			Total	19	4	2	1	25	24

SEMESTER - IV

Ι	Language	XGT401	Tamil – IV	3	0	0	0	3	3
II	Language	XGE402	English – IV	3	0	0	0	3	3
III	Core – 7	XMT403	Object Oriented Programming with	3	1	0	0	4	4
			C++						
	Core - 8	XMT404	Fourier Series and Transforms	3	1	0	0	4	4
	Allied – 4	XMT405	Statistics for Data Science - II	2	1	0	0	3	3
	(DSC)	AWI1403							
	Allied – 4	XMT406	Statistics for Data Science –II - Lab	0	0	2	0	2	1
	(DSC)	AWI1400	using R-Programming						
	SEC – 3	XMT407	Vedic Mathematics - I	1	1	0	0	2	2
IV	GE: Open		Open Elective- 2	3	0	0	0	3	3
	Elective								
	UMAN - 4	XUM004	Introduction to Entrepreneurship	1	0	0	1	1	1
			Development						
			Total	19	4	2	1	25	24

SEMESTER -V

III	Core - 9	XMT501	Abstract Algebra	3	1	0	0	4	4
	Core - 10	XMT502	Real Analysis	3	1	0	0	4	4
	Core - 11	XMT503	Number Theory	3	1	0	0	4	4
	DSE – 1	XMT504A	Graph Theory						
		XMT504B	Mathematical Modeling						
		XMT504C	Numerical Methods with	3	1	0	0	4	4
			MATLAB						
		XMT504D	Discrete Mathematics						
	SEC - 4	XMT505	Vedic Mathematics - II	1	1	0	0	2	2
	NME	XMT506	Python Programming /	2	1	0	0	3	3
			Mathematics for Finance						
	GE: Open		Open Elective- 3	3	0	0	0	3	3
	Elective								
IV	IPT		IPT/Internship	0	0	0	0	0	2
	Core		Project Phase - I	0	0	3	0	3	1
			Total	18	6	3	0	27	27

SEMESTER - VI

III	Core -12	XMT601	Complex Analysis	3	1	0	0	4	4
	Core -13	XMT602	Mechanics	3	1	0	0	4	4
	Core – 14	XMT603	Optimization Techniques	3	1	0	0	4	4
	DSE - 2	XMT604A	Industrial Mathematics 4.0						
		XMT604B	Introduction to Machine Learning	3	1	0	0	4	4
		XMT604C	Astronomy						
		XMT604D	Stochastic Processes						
	Core-15	XMT605	Project Phase - II	1	0	4	0	5	3
IV	UMAN - 5	XUM005	Cyber Security	1	0	0	1	1	1
			Total	14	4	4	1	22	20
			Total Credit						139

SEMESTER I

பொதுத்தமிழ் - 1

பாடக்குறியீ டு/ Course Code	பாடப்பெயர்/ Course Name	Category	L	T	Р	SS	H	С
XGT101	பொதுத்தமிழ் - 1	Supportive	3	0	0	0	3	3
Pre-requisite	பன்னிரெண்டாம் டும்.	பகுப்பில்தமிழை	ஒருபாட	_மாகட	່ມບາບປີຄ	எறிரு	க்கவே	பண்
பாடப்பயன் கள் / Course outcomes	இப்பாடத்தைக்கற்	பதால்பின்வரும்	பயன்க	ளைம	ாணவ	பர்கள்,	அடை	வர்.
CO1	கவிதைஇலக்கிய டைப்பாற்றல்திறக		தப்படுஎ	பதால்		ிந்துெ nderstar	காள்எ nd)	ால்
CO2	புதுக்கவிதைவரல	றாற்றினை அறிந் _ย	துகொள்	வர்.	(Ui	nderstar		
CO3	இக்காலஇலக்கிய டைப்பாக்கத்திறன	•	ற்பதன்ர	மலம்	၂ လံ	தப்பார alyze	പ്പില്	சய்த
CO4	மொழிஅறிவோடு	சிந்தனைத்திறன்	ாஅதிகரி	த்தல் .	ல்	நரிந்து oply)	கொ	ាតា
CO5	தமிழ்மொழியைப் புதியகலைச்சொ <u>ர்</u> கொள்ளுதல்.		•	றிந்து	-	ிந்துெ nderstar	காள்எ nd)	ால்
	K1- Remember; K2 – U Evaluate; K6 – Create.	Jnderstand; K3 – Appl	y; K4 Ana	alyze; K	5			
அலகு - I	L	மரபுக்கவிதை			9 🗆	ഞിദ	ள்	
	2. பாரதிதாசன் 3. கவிமணி - ட	ார்- தமிழ்த்தெய்வ – சிறுத்தையை த்தரும்சிறுவனு - மொழிஉணர்ச்சி	வளியே ம்					

	7. வீட்டின்மூலையில்சமையலறை - அம்பை. (மொழிபெயர்ப்புக்கதை) ஆண்டன்செக்காவ்	
	6. காகிதஉறவு - சு.சமுத்திரம் .	
	 சிதறல்கள் - விழி.பா.இதயவேந்தன். 	
	4. முள்முடி - திஜானகிராமன்.	
	3. கரு - உமாமகேஸ்வரி.	
	2. கடிதம் - புதுப்பித்தன்.	
	மாலைமயக்கம்தொகுப்பு	
	1. வாய்ச்சொற்கள் – ஜெயகாந்தன்	
அலகு - III	சிறுகதைகள்	9 மணிகள்
	8. இளம்பிறை – நீஎழுதமறுக்கும்எனதுஅழகு.	
	7. சுகிர்தாராணி – சபிக்கப்பட்டமுத்தம்.	
	ஆனந்தயாழைமீட்டுகிறாய்.	
	6. நா.முத்துக்குமார் –	
	5. அறிவுமதி – வள்ளுவன்பத்து.	
	4. மு.மேத்தா – வாழைமரம்.	
	3. வைரமுத்து – பிற்சேர்க்கை	
	2. ஈரோடுதமிழன்பன் - வணக்கம்வள்ளுவ.	
	வீட்டுக்குஒருமரம்வளர்ப்போம்.	
	1. அப்துல்ரகுமான் –	
அலகு - II	புதுக்கவிதை	9 மணிகள்
	7. தமிழ்ஒளி - கடல்	
	ம்ஒருகவிதை	
	 சுரதாதுறைமுகம்தொகுப்பிலிருந்துஏதேனு 	
	ஆதிமந்திபுலம்பல்.	
	5. கண்ணதாசன் – ஆட்டனத்திஆதிமந்தி –	

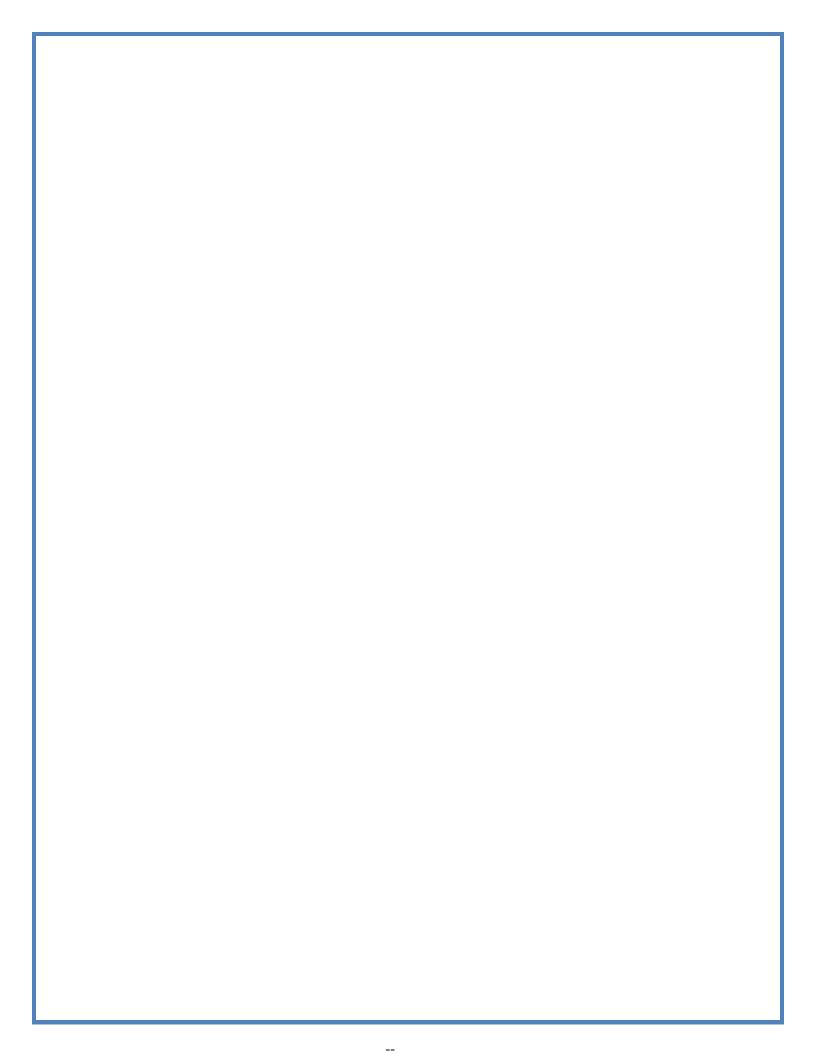
	 பாருள்பொதிந்தசொற்றொடர்அமைத்த 	ல்
	2. ஓர்எழுத்துஒருமொழி	
	3. வேற்றுமைஉருபுகள்	
	4. திணை, பால், எண், இடம் 5. கலைச்சொல்லாச் சும் மொலெயாச்ப்ப	
	 கலைச்சொல்லாக்கம், மொழிபெயர்ப்பு (குறிப்பு : அலகு 4, ஆகியபகுதிகள்போட்டித்தேர்வுநோக்கில் 	5)நட
	த்தப்படவேண்டும்)	
பாடநூல்கஎ	<u>ו</u> ה	
1.	மேலேசுட்டப்பட்டுள்ளகவிதைகள், பாடம்தொ	டர்புடையநூல்கள்
பார்வைநூ	ប់ភតាំ	
1.	தமிழ்இலக்கியவரலாறு –	
	சிற்பிபாலசுப்பிரமணியன்.	
2.	புதியநோக்கில்தமிழ்இலக்கியவரலாறு -	
	தமிழண்ணல்	
3.	வகைமைநோக்கில்தமிழ்இலக்கியவரலாறு – எஃப்.பாக்கியமேரி.	

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

Web Sources

- Tamil Heritage Foundation www.tamilheritage.org<http://www.tamilheritage.org>
- Tamil virtual University Library www.tamilvu.org/library http://www.virtualvu.org/library
- Project Madurai www.projectmadurai.org.
- Chennai Library www.chennailibrary.com<http://www.chennailibrary.com>.
- Tamil Universal Digital Library-www.ulib.prg<http://www.ulib.prg>.
- Tamil E-Books Downloads tamilebooksdownloads.blogspot.com
- Tamil Books online books.tamilcube.com
- Catalogue of the Tamil books in the Library of British Congress archive.org
- Tamil novels online books.tamilcube.com

Strong-3, Medium-2, Low-1



COURSI	E CODE	XGE102	L	Т	Р	SS	Н	C	
COURSI	ENAME	ENGLISH I	3	0	0	0	3	3	
C:P:A- 3	:0:0								
	E OUTCOM	ES:	D	oma	in	Ι	level		
	completion ensive skills	of course, the learners will be able to get like:							
CO1	Develop and	integrate the use of the four language skills i.e. ening, Speaking and Writing	Со	gniti	ive	Uno	Understand		
	Understand t context.	he total content and underlying meaning in the	Co	gniti	ive	A	Apply	/	
CO3	Form the hab	it of reading for pleasure and for information	Со	gniti	ive	Und	ersta	nd	
	-	material other than the prescribed text	Со	gniti	Unc	lersta	and		
	-	linguistic competence that enables them, in the ent the culture and civilization of their nation.	Co	gniti	Unc	Understand			
SYLLAB	SUS				I		HO	UR	
UNIT-I	POETRY					6-	+3+0	=9	
1.2 Th 1.3 A	e Sparrow - F	l - Subramania Bharati Paul Laurence Dunbar ngth – Ralph Waldo Emerson ninua Achebe				6-	+3+0	=9	
2.1 JR	D - Harish B	hat							
2.2 Us	and Them -	David Sedaris From Dress Your Family in Cordur Hangs a Picture - Jerome K Jerome	oy ar	nd D	enin	n			
	SHORT S					6	+3+0	=9	
3.2 Ho	w I Taught n	endulum- Bhabani Bhattacharya ay Grandmother to Read - Sudha Murthy - R.K. Laxman							
UNIT-IV	LANGUA	GE COMPETENCY				6-	+3+0)=9	
4.2 Ap		nonyms, Antonyms, Word Formation of Articles and Parts of Speech							
UNIT - V	ENGLISH	I FOR WORKPLACE				(<u>5</u> +3+	0=9	
5.2 Int	roducing othe								
5314	stening for Ge	eneral and Specific Information							

L=30 / T=15	Total Hours 4
utorial Activities	
1) Reading and understanding incomplete texts	
2) Summarize a piece of prose or poetry	
3) Communication Practice	
4) Role play	
Text books	
Hogan, Sharon. The Art of Civilized Conv	versation: A Guide to Expressing

CO	URSE NA	ME		Algebra	& Trigo	nometry	L	T	Р	C			
CO	URSE CO	DE			XMT103		3	1	0	4			
С	Р	Α					L	Т	Р	Н			
4	0	0					3	1	0	4			
PREREC	QUISITE		Nur	nber systems									
On succe	essful com	pletion o	of this	course, the stu	idents wil	l be able to:							
		CC	OURS	E OUTCOME	S		DOMA	IN	LEV	EL			
CO 1	Utilize H	orner's N	Aethoo	l to obtain the r	oots of po	lynomials	Cognitiv	ve	Appl	ing			
CO 2	CO 2 Find the summation of the given series such as binomial, exponential and logarithmic series Cognitive Remembering												
CO 3													
CO 4Find the expansion of trigonometric ratios in terms of θ CognitiveRemembering													
CO 5 Explain the relation between circular and hyperbolic functions Cognitive Understanding													
UNIT 1 9+3													
-	-				-	easing the roots o	-	-	n – Rem	oval of			
UNIT 2	oproximate	solution	5 01 10	ous orporynom	laisoynoi	ner'smethod-relat	euproblem	15.	9.	+ 3			
	on of Seri	es: Binor	nial–	Exponential	–Logar	ithmic series(The	oremswith	out	I	proof)–			
Approxin	nations-re	latedprob	lems.	Ĩ	U	X							
UNIT 3									9 -				
	risticequati			valuesandEigen						Cayley-			
						matrix, Inverse of	f a square	matrix	up to o	order 3,			
UNIT 4	ization ofs	quare ma	trices	-related probler	ns.				0	+ 3			
	cos ^m θsir					sion of tann θ interr ,+ θ_n)-Expansion			nsions o	$f \cos^n \theta$,			
UNIT 5									9 -	+ 3			
	ic functior	ns – Rela	ation 1	between circula	ar and hy	perbolic functions	s-Inverse h	nyperb					
		lex quan	tities,	- relatedproble	ns.								
LEC	ГURE	45		TUTORIAL	15	PRACTICAL	0	тот	AL	60			
Text Boo	ok												
Unit I - 1 Unit II - 2 Unit III - Unit IV -	[Vol-I], 21 2,3,4[Vol-] 4[Vol-II], 6[Vol-I],	-23,36-4 [], 71-100 59-96 122-141	3,65-7)	•	Thilagava	thy,S.ChandPublic	cation, 1 st E	Edition	, 2004.				

References

- 1. AlgebraandTrigonometry,J.Stewart,L.Redlin,andS.Watson,CengageLearning,2012.
- 2. CalculusandAnalyticalGeometry,G.B.ThomasandR.L.Finny,PearsonPublication,9th Edition, 2010.

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https://nptel.ac.in

	COs VS POs											
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	
CO 1	3	3	2	0	1	3	3	3	3	3	0	
CO 2	2	1	0	0	0	1	1	1	2	1	0	
CO 3	3	3	2	0	1	3	3	3	3	3	0	
CO 4	2	1	0	0	0	1	1	1	2	1	0	
CO 5	3	2	1	0	0	2	2	2	3	2	0	
TOTAL	13	10	5	0	2	10	10	10	13	10	0	
SCALED VALUE	3	3	1	0	1	2	2	2	3	2	0	
0 - No Relation, 1 –	- No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation											

 $1 ext{-}5 ext{-}1, 6 ext{-}10 ext{-}2, 11 ext{-}15 ext{-}3$

CO	URSE NAI	ME	Differ	ential Ca	lculus	L	T	Р	C				
CO	URSE CO	DE		XMT104		3	1	0	4				
С	Р	Α				L	Т	Р	Н				
4	0	0				3	1	0	4				
PREREC	QUISITE]	Basic differentiation	on formula	ı	1	1						
On succe	essful com	pletion of t	his course, the stu	idents wil	l be able to:								
		COU	RSE OUTCOME	S		DOMA	IN	LEV	EL				
CO 1	CO1UtilizeLeibnitz formula to find nth derivative of a given function.CognitiveApplying												
CO 2	CO 2 Identify the partial derivatives of the given functions. Cognitive Applying												
CO 3	CO 3 Utilize Lagrange's method to findthemaximaand minima of a Cognitive Applying functionoftwo variables.												
CO 4													
CO 5Identify evolute of a given family of curves.CognitiveApplying													
UNIT 1								9+	- 3				
Introduction (Review of basic concepts)–Then th derivative–Standardresults–Fractionalexpressions-Trigonometricaltransformation–Formationofequationsinvolvingderivatives–Leibnitzformula forthen th derivativeofaproduct. UNIT 2 9+3 Partial derivatives - Successive partial derivatives – Function of function rule – Total differential coefficient -													
Implicit f	unctions							9+	2				
	neousfuncti	ons-Partial	derivatives of a	a functio	n of two func	tions –M	axima		ninima				
offunctio	nsoftwova	riables-Lag	range'smethodofu	ndetermin	edmultipliers.								
UNIT 4	0.01.11							9+					
	of finding in the para	-	- Another definiti	on of env	elope- Envelope	of family	of curv	es whi	ich are				
UNIT 5	In the pare							9+	- 3				
Definition	n of Curva	ature – Ciro	cle, Radius and C	entre of (Curvature – Evolu	ites and In	volutes						
	*	- ordinates				0	TOTA	-	<u></u>				
	ΓURE	45	TUTORIAL	15	PRACTICAL	0	ΤΟΤΑ	L	60				
Text Boo	k												
 Calculus Volume I, S. Narayanan and T.K. Manicavachagom Pillay, S. Viswanathan Pvt. Ltd., 2014. Unit I - Chapter III All sections (Pages 69 to 87) Unit II - Chapter VIII Sections: 1.1 to 1.5 (Pages 178 to 191) Unit III - Chapter VIII Sections: 1.6 to 1.7,4 & 5 (Pages 191 to 204,222 to 2347) Unit IV- Chapter IV Sections: 1.1 to 1.4, (Pages 281 to 291) Unit V- Chapter V Sections :2.1 to 2.3& 2.5 (Pages 291 to 301,309 to 312) References 													
Neieren													

- 1. Calculus, H. Anton, I. Birens and S. Davis, John Wiley and Sons, Inc., 2002.
- 2. Calculus, G.B. Thomas and R.L. Finney, Pearson Education, 2010.
- 3. Calculus, M.J. Strauss, G.L. Bradley and K. J. Smith, 3rd Ed., Dorling Kindersley (India) P. Ltd. (Pearson Education), Delhi, 2007.
- 4. Introduction to Calculus and Analysis (Volumes I & II), R. Courant and F. John, Springer- Verlag, New York, Inc., 1989.
- 5. Calculus, Volumes I and II, T. Apostol.
- 6. Calculus and mathematical analysis, S. Goldberg,

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- 1. https://nptel.ac.in
- 2. https://www.math.columbia.edu/programs-math/undergraduate-program/ [Columbia University]
- 3. <u>https://www.math.harvard.edu/undergraduate/?courseid=63/(Hardvard University)</u>

	COs VS POs										
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 1	3	3	2	0	1	3	3	3	3	3	0
CO 2	3	3	2	0	1	3	3	3	3	3	0
CO 3	3	3	2	0	1	3	3	3	3	3	0
CO 4	3	3	2	0	1	3	3	3	3	3	0
CO 5	3	3	2	0	1	3	3	3	3	3	0
TOTAL	15	15	10	0	5	15	15	15	15	15	0
SCALED VALUE	3	3	2	0	1	3	3	3	3	3	0
0 - No Relation, 1 -	Low Re	lation, 2	2- Medi	ium Re	lation, 3	3- High	Relatio	n		•	•

 $1-5 \rightarrow 1, 6-\overline{10 \rightarrow 2, 11-15 \rightarrow 3}$

COU	RSE C	CODE	COURSE NAME	L	Τ	Р	C		
XPG	105			3	0	0	3		
С	Р	Α	ALLIED PHYSICS – I	L	T	Р	H		
2.7	0	0.3		3	1	0	4		
COURSE OUTCOMES: At the end of the course, the student will be able to									
would		lpful fo	o impart basic principles of Physics that which r students who have taken programmes other	DOM	AIN	LEV	EL		
CO1	the der	study monstra	ypes of motion and extend their knowledge in of various dynamic motions analyze and ate mathematically. <i>Relate</i> theory with practical ns in medical field.	Cognit	ive	Remember, Understand Apply			
CO2		d <i>apply</i>	heir knowledge of understanding about materials it to various situations in laboratory and real	Cognit	ive	Understand apply			
CO3		-	end basic concept of thermodynamics concept of and <i>interpret</i> the process of flow temperature.	Cognit	ive		ember rstand		
CO4	cap	Articulatethe knowledge about electric current resistance, capacitance in terms of potential electric field and analyze them mathematically verify circuits.Un CognitiveUn Cognitive							
CO5	bas	sic logi	the real life solutions using AND, OR, NOT c gates and <i>Infer</i> operations using Boolean ad acquire elementary ideas of IC circuits.	Cognifive			Remember analyze		

UNIT – I	WAVES, OSCILLATIONS AND ULTRASONICS	9+3							
Simple harmonic motion (SHM) – composition of two SHMs at right angles (periods in the ratio 1:1) – Lissajous figures – uses – laws of transverse vibrations of strings – determination of AC frequency using sonometer (steel and brass wires) – ultrasound – production – piezoelectric method – application of ultrasonics: medical field – lithotripsy, ultrasonography – ultrasonic imaging- ultrasonics in dentistry – physiotheraphy, opthalmology – advantages o noninvasive surgery – ultrasonics in green chemistry									
UNIT – II	UNIT – IIPROPERTIES OF MATTER9 + 3								
<i>Elasticity</i> : elastic constants – bending of beam – theory of non- uniform bending – determination of Young's modulus by non-uniform bending – energy stored in a stretched									

		LECTURE	TUTORIAL	TOTAL
	C			
	a – De Morgan's theorem – plogical parks under MeitY ntroduction to Digital India.	, NIELIT- semicondu		
	R, AND, NOT, NAND, NO			
UNIT – V I	DIGITAL ELECTRONIC	S AND DIGITAL IN	DIA	9 + 3
due to a current carrying curren current values i	- principle – measurement o carrying conductor – Biot- t – peak, average and RMS n an AC circuit – types of s and circuit breakers in hous	Savart's law – field alc values of ac current an witches in household a	ong the axis of the d voltage – powe	e coil r factor and
UNIT – IV	ELECTRICITY AND M	AGNETISM		9+3
inversion – liqu medical purpos equilibrium – la change of entro	effect – Joule-Thomson por efaction of Oxygen– Linde e– importance of cryocooler two of thermodynamics – he py in reversible and irrevers	's process of liquefactions rs – thermodynamic sy eat engine – Carnot's c sible process.	on of air– liquid (stem – thermody	Dxygen for namic – entropy –
UNIT – III	HEAT AND THERMOD			9+3
	: definition – molecular the ission through droplets, sali	• •	· · · · · · · · · · · · · · · · · · ·	
Poiseuille's for	mula – comparison of visco	sities – burette method	,	
Viscosity: streau	nline and turbulent motion	– critical velocity – co	efficient of viscos	sitv –
			rsional pendulum	

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- R. Murugeshan, Er. Kiruthiga Siva Prasath, "Properties of Matter and Acoustics", S.Chand& Company Ltd, Ram Nagar, New Delhi - 110 055, First edition 2005, Second Edition 2012.
- 3. Brijlal and N.Subramanyam (1994), Waves and Oscillations, Vikas Publishing House, New Delhi
- 4. V.K.Metha(2004). Principles of electronics 6thEdn. S. Chand and company.

5. J.B.Rajam and C.L.Arora (1976). Heat and Thermodynamics (8th edition), S.Chand&Co.,New Delhi.

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- **2.** Brij Lal, N Subrahmanyam, "*A Textbook of Sound*" 2nd Edition, Vikas Publishing House Pvt.Ltd.A–27, 2nd Floor, Mohan Co–operative Industrial Estate, New Delhi–110044, 2018.
- **3.** ResnickHallidayandWalker(2018).FundamentalsofPhysics(11thedition),JohnWilleyand Sons, Asia Pvt.Ltd., Singapore.
- 4. R. Murugesan (2001), Allied Physics, S. Chand & Co, New Delhi
- **5.** V.R. Khannaand R.S. Bedi (1998), Text book of Sound 1stEdn. Kedharnaath Publish &Co, Meerut.
- 6. N.S. Khare and S.S.Srivastava (1983), Electricity and Magnetism10thEdn., Atma Ram &Sons, New Delhi

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- 1. https://youtu.be/M_5KYncYNyc
- 2. https://youtu.be/ljJLJgIvaHY
- 3. https://youtu.be/7mGqd9HQ_AU
- 4. https://youtu.be/h5jOAw57OXM
- 5. https://learningtechnologyofficial.com/category/fluid-mechanics-lab/
- 6. http://hyperphysics.phy-astr.gsu.edu/hbase/permot2.html
- 7. https://www.youtube.com/watch?v=gT8Nth9NWPM
- 8. https://www.youtube.com/watch?v=9mXOMzUruMQ&t=1s
- 9. https://www.youtube.com/watch?v=m4u-SuaSu1s&t=3s
- 10. https://www.biolinscientific.com/blog/what-are-surfactants-and-how-do-they-work

Course Outcomes	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO9	PO10	PSO1	PSO2
CO ₁	3	0	1	0	1	3	1	2	1	2	2	1
CO ₂	2	0	1	2	1	3	1	1	1	2	2	1
CO ₃	2	1	3	3	1	3	2	1	0	2	1	1
CO ₄	1	1	2	3	2	3	1	2	0	2	2	2
CO ₅	2	1	1	3	1	3	1	2	1	2	1	1
Total	10	3	8	11	6	15	6	8	3	10	8	6
Scaled to 1, 2, 3	2	1	2	3	2	3	3	2	1	2	2	2

Mapping with Programme Outcomes

0 - No relation 1 - Low relation 2 - Medium relation

3 – High relation

CO	URSE C	CODE	COURSE NAME	L	Τ	P	C	
XP	G106			0	0	1	1	
С	Р	Α	ALLIED PHYSICS PRACTICAL – I	L	Т	Р	Η	
0	0.75	0.25	_	0	0	2	2	
		OUTCON essful con	MES mpletion of this course students would able to	Dom	ain	Lev	rel	
CO	CO1 <i>Develop Knowledge</i> on bending of beams, its properties and <i>application</i> r							
CO			principles of elasticity, <i>derive</i> expression for ple and <i>determine</i> rigidity modulus of a wire.	-	homoto fective:	Analyze, Mechanism Respond		
CO			<i>d flow</i> of liquid, viscosity and <i>identify</i> its <i>and Define</i> surface tension	r:	homoto ctive:	_	oly chanism reive	
CO		all the co lain the c	Psyc r: Af	ılyze chanism eive				
CO		nderstand lications	Psyc r: Af	Analyze Mechanism Receive				

Ex. No	Experiments (Any eight experiments)	Cos
1.	Young's modulus by non-uniform bending using pin and microscope	CO2
2.	Young's modulus by non-uniform bending using optic lever, scale and telescope	CO2
3.	Rigidity modulus by static torsion method.	CO1

HOUH	RS	0	30	30		
		LECTURE	PRACTICAL	TOTAL		
12	Use of NAND as universal building b	lock.		CO5		
11	Verification of De Morgan's theorem	s using logic gate	ICs.	CO5		
10.	Determination of thermo emf using p	otentiometer		CO4		
9.	Calibration of low range voltmeter using potentiometer					
8.						
7.	Specific heat capacity of a liquid – ha	If time correction		CO3		
6.	Comparison of viscosities of two liqu	ids – burette meth	od	CO3		
5.	Surface tension and interfacial Surfac	e tension – drop w	veight method	CO3		
4.	Rigidity modulus by torsional oscillat	ions without mass	5	CO1		

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Course Outcomes	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO9	PO10	PSO1	PSO2
CO ₁	1	1	3	3	2	3	1	3	0	1	2	1
CO ₂	1	1	3	2	1	3	1	3	1	1	2	1
CO ₃	1	1	3	3	1	3	2	3	1	2	2	1
CO ₄	1	1	2	2	2	3	1	3	1	2	2	1
CO ₅	1	1	3	3	2	3	1	3	1	2	2	1
Total	5	5	14	13	8	15	6	15	4	8	10	5
Scaled to 1, 2, 3	1	1	3	3	2	3	2	3	1	2	2	1
0 – No re	0 - No relation $1 - Low relation$ $2 - Medium relation$ $3 - High relation$											

Mapping of COs with POs

CO	URSE NA	ME		Foun	dation Co	ourse	L	Т	P	C		
CO	URSE CO	DE			XMT107		1	1	0	2		
С	Р	Α					L	Т	Р	H		
2	0	0					1	1	0	2		
PREREC	QUISITE		Nun	nber systems &	Algebra		1	_				
On succe	essful com	pletion o	f this	course, the stu	dents wil	l be able to:						
		CO	URSI	E OUTCOME	S		DOMA	IN	LEV	VEL		
CO 1	Find a guild using bin			nd middle tern	in a bin	omial expansion	Cognitiv	ve	Remen	nbering		
CO 2 Find the number of possible combinations for a given situation using the fundamental counting principle. Cognitive Remembering												
CO 3Find the combinations of objects with repetitions.CognitiveRemembering												
CO 4 Find the 6 trigonometric functions using a calculator, as well as determining exact values for some special angles without a calculator. Remembering												
CO 5Find derivatives of the given composite functions.CognitiveRemembering												
UNIT 1										3+3		
	theorem,	General to	erm, n	niddle term, pro	oblems ba	sed on these conce	epts.			2.2		
UNIT 2 Fundame	ntal princi	ple of cor	inting	Factorial n.						3+3		
UNIT 3										3+3		
					· · ·	e applications, o	combinatio	ons w	ith rep	oetitions		
UNIT 4	ents within	n groups,	forma	tion of groups.						3+3		
Introduct multiple	angles, si	n(2A), co	os(2A)		, transform	cos(A+B), tan(A+ nations sum into ine rule.				and su		
UNIT 5										3+3		
			-	,	,	first principle, uut rule and substi	,		e, meth	ods of		
	TURE	15		TUTORIAL	15	PRACTICAL	0	TOT	AL	30		
Text Boo	ok											
1. NC	ERT class				class XI a	nd XII current Ed	ition					
Reference		a a manit	matic	5 WAL DOURS UI	C1000 A1 6							
		lathemati	cs text	books of class	XI and X	II, Old Edition.						
E-Refere	ences											
https://np	tel.ac.in								_	_		

CO1 2 1 0 0 0 1 1 1 2 1 0 CO2 2 1 0 0 0 1 1 1 2 1 0 CO3 2 1 0 0 0 1 1 1 2 1 0 CO4 2 1 0 0 0 1 1 1 2 1 0 CO5 2 1 0 0 0 1 1 1 2 1 0 TOTAL 10 5 0 0 0 5 5 5 10 5 0					CO	s Vs PO)s					
CO 2 2 1 0 0 0 1 1 1 2 1 0 CO 3 2 1 0 0 0 1 1 1 2 1 0 CO 4 2 1 0 0 0 1 1 1 2 1 0 CO 5 2 1 0 0 0 1 1 1 2 1 0 TOTAL 10 5 0 0 0 5 5 10 5 0		PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 3 2 1 0 0 0 1 1 1 2 1 0 CO 4 2 1 0 0 0 1 1 1 2 1 0 CO 5 2 1 0 0 0 1 1 1 2 1 0 TOTAL 10 5 0 0 0 5 5 5 10 5 0	CO 1	2	1	0	0	0	1	1	1	2	1	0
CO 4 2 1 0 0 0 1 1 1 2 1 0 CO 5 2 1 0 0 0 1 1 1 2 1 0 TOTAL 10 5 0 0 0 5 5 10 5 0	CO 2	2	1	0	0	0	1	1	1	2	1	0
CO 5 2 1 0 0 0 1 1 2 1 0 TOTAL 10 5 0 0 0 5 5 5 10 5 0	CO 3	2	1	0	0	0	1	1	1	2	1	0
TOTAL 10 5 0 0 0 5 5 10 5 0	CO 4	2	1	0	0	0	1	1	1	2	1	0
	CO 5	2	1	0	0	0	1	1	1	2	1	0
SCALED VALUE 2 1 0 0 0 1 1 2 1 0	TOTAL	10	5	0	0	0	5	5	5	10	5	0
	SCALED VALUE	2	1	0	0	0	1	1	1	2	1	0

	RSE CODE	XUM001		L	Τ	Р	SS	С		
COUR	RSE NAME	HUMAN ETHICS, VALUES	, RIGHTS AND	1	0	0	1	1		
		GENDER EQUALITY								
PRER	EQUISITES	Not Required		L	Т	Р	SS	Η		
C:P:A		0.8:0.1:0.1		1	0	0	1	2		
COUR	RSE OUTCON	IES	Domain	Le	vel					
CO1	Relate and	Interpret the human ethics and	Cognitive	Remember, Understand						
COI	human relation	onships	Cognitive	Un	ders	stan	d			
CO2	<i>Explain</i> and	Apply gender issues, equality and	Cognitive	Understand,						
02	violence agai	nst women	Cognitive	Apply						
CO3	Classify and	Develop the identify of women	Cognitive &	An	alyz	ze				
COS	issues and ch	allenges	Affective	Re	ceiv	e				
CO4	ClassifyandL	Dissect human rights and report on	Cognitivo	Un	ders	stan	d,			
CO4Counterstand respond to family values, universalCognitiveCondensation, CognitiveList and respond to family values, universalCounterstand, CognitiveRemember,										
	List and respond to family values, universal brotherhood, fight against corruption by						·,			
CO5	brotherhood,	U	Re	spoi	nd					
CO5 brotherhood, fight against corruption by common man and good governance. Corruption by Affective Respond UNIT I HUMAN ETHICS AND VALUES 3+3										
UNIT IHUMAN ETHICS AND VALUES3+3HUMAN ETHICS AND VALUES3										
	npathy, Self res	and Courage, Time Management spect, Self-Confidence, Personality		miti	men	t, S	, 1	•		
UNIT Gender Social HDI,	npathy, Self res IIGENDER E r Discrimination and Economic GDI and GEM	Spect, Self-Confidence, Personality QUALITY on in society and in family, Geno Status of Women in India in Educa M. Contributions of Dr.B.R. Am	Development ler equity, equality, ation, Health, Employ	and	em nt, I	pov Defin	3+ verme	3 ent. 1 of		
UNIT Gender Social HDI, O Wome	npathy, Self res IIGENDER E r Discrimination and Economic GDI and GEM n Empowerme	Spect, Self-Confidence, Personality QUALITY on in society and in family, Gence Status of Women in India in Educa M. Contributions of Dr.B.R. Am nt.	Development ler equity, equality, ation, Health, Employ	and	em nt, I	pov Defin	3+. verme nitior Phule	3 ent. n of to		
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		15	15	30
REFE	RENCES			
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2.	Bajwa, G.S. and Bajwa, D.K. Hun (New Delhi: D.K. Publications, 1990)	-	India: Implementation	and Violation
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	Veeramani, K. (ed) Periyar Fen Thanjavur: 2010).	•		
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11.	Central Vigilance Commission (Gov	v. of India) web	site: http://cvc.nic.in/we	elcome.html.
	Weblink of Transparency Internation		-	
	Weblink Status report: https://www.	-	1 1 0	· /• 1•

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1								2						
CO2								3	1					
CO3								2						
CO4								3		2				
CO5								3	2	2		2		
Total		2						13	3	4		2		
Scaled		1						3	1	1		1		
Value														

Table 1 : Mapping of COs with Pos

SEMESTER II

பொதுத்தமிழ் - 2

பாடக்குறியீ டு/ Course Code	பாடப்பெ யர்/ Course Name	Category	L	Т	Р	SS	H	С			
XGT201	பொதுத் தமிழ் - 2	Supportive	3	0	0	0	3	3			
Pre-requisite	பன்னிரெ க்கவேண்	ண்டாம்வகுப்பில் டும்	தமிழை	<u></u> ஒருபா	டமாச	ாகப்பயின்றிரு					
பாடப்பயன் கள் / Course outcomes	இப்பாடத் அடைவர்	•									
CO1	யினையுட	திஇலக்கியங்களைக்கற்பதன்மூலம்நீதிநெறி பினையும்வாழ்வியல்மற்றும்மேலாண்மைச் பிந்தனைகளையும்தெரிந்துபின்பற்றுவர்									
CO2		சிற்றிலக்கியங்களின்வழிஇலக்கியச்சுவையி னையும்பண்பாட்டுஅறிவினையும்பெறுவர்									
CO3		ப்பினைப்படிக்குப் தமிழ்இலக்கியங் றுவர்	-	-		் பகுப்பாய்வ செய்தல் Analyze					
CO4	கியங்கள்	தமிழ்ச்சமூகப்பண்பாட்டுவரலாற்றினைஇலக் கியங்கள்வாயிலாகஅறிவர்									
CO5	CO5 போட்டித்தேர்வுகளில்வெற்றிபெறுவதற்குத்த ற்றபயிற்சிபெறுவர் K1- Remember; K2 – Understand; K3 –Apply; K4 Analyze;						(Understand)				
அல	K5 Evaluate; K6 – Create. நீதிஇலக்கியம்							ரிக			

சு - I		ள்
	திருக்குறளில்வாழ்வியல் –	
	திருக்குறளில்மேலாண்மைச்சிந்தனைகள்	
அல	பிறஇலக்கியங்கள்	9மணிக
கு - II		ள்
	வள்ளலார் – அருள்விளக்கமாலை (முதல் 10 பாடல்கள்)	
	– எச்.ஏ.கிருட்டிணப்பிள்ளை – இரட்சணியமனோகரம் –	
	பால்யபிரார்த்தனை – குணங்குடிமஸ்தான்சாகிபு –	
	பராபரக்கண்ணி (முதல் 10 கண்ணி)	
அல	சிற்றிலக்கியங்கள்	9மணிக
கு -		ள்
III		
	தமிழ்விடுதூது (முதல் 20 கண்ணி) –	
	திருக்குற்றாலக்குறவஞ்சி – குறத்திமலைவளம்கூறல் –	
	முக்கூடல்பள்ளு – நாட்டுவளம்	
அல	இலக்கியவரலாறு	9மணிக
கு -IV		ள்
	பாடம்தழுவியஇலக்கியவரலாறு (பல்லவர்காலம்,	
	நாயக்கர்காலம்)	
அல	மொழித்திறன்/ போட்டித்தேர்வுத்திறன்	9மணிக
க - V		ள்
	1. தொடர்வகைகள்	
	2. மரபுத்தொடர், பழமொழிகள்	
	 பிறமொழிச்சொற்களைக்களைதல் 	
	 வழுச்சொற்கள்நீக்குதல் 	
	5. இலக்கணக்குறிப்புஅறிதல்	
	(குறிப்பு : அலகு 4, 5	45

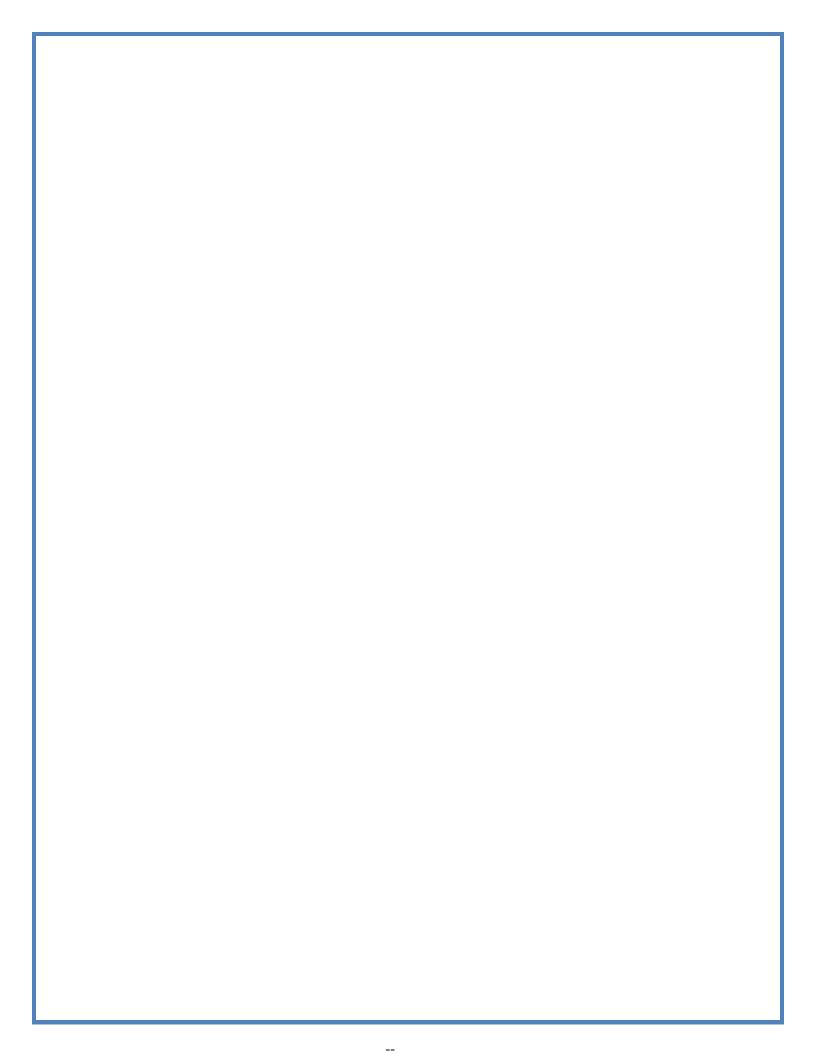
	ஆகியபகுதிகள்போட்டித்தேர்வுநோக்கில்நடத்தப்படவே	மணிக
	ண்டும்)	ள்
பாடநு	тல்கள்	
1.	திருக்குறள், மணிவாசகர்பதிப்பகம், சென்னை	1
2.	இலக்கியத்தல்மனிதவளமேம்பாடு, சி. சரவணஜோதி,	
	பாவைபப்ளிகேசன்ஸ்,	
3.	தமிழ்விடுதூது	
4.	திருக்குற்றாலக்குறவஞ்சி	
5.	எச்.ஏ.கிருட்டிணப்பிள்ளை – இரட்சணியமனோகரம்	
பார்ன	வநூல்கள்	
1.	தமிழ்இலக்கியவரலாறு – சிற்பிபாலசுப்பிரமணியன்.	
2.	புதியநோக்கில்தமிழ்இலக்கியவரலாறு - தமிழண்ணல்	
3.	வகைமைநோக்கில்தமிழ்இலக்கியவரலாறு –	
	எஃப்.பாக்கியமேரி.	

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

Web Sources

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- Tamil virtual University Library www.tamilvu.org/library http://www.virtualvu.org/library
- Project Madurai www.projectmadurai.org.
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Strong-3, Medium-2, Low-1



COURSE	CODE	XGE202	L	Т	Р	SS	Η	С
COURSE	NAME	ENGLISH II	2	1	0	0	3	3
C:P:A-3:	0:0							
COURSE	OUTCOM	ES:	D	oma	in	Ι	Level	
		of course, the learners will be able to get						
	ensive skills							
		oduce themselves and talk about	Co	gniti	ve	Un	dersta	and
		vities confidently	0	• • •				
		short paragraphs on people, places and events		gniti			Apply	
e	employ them in speaking and writing							nd
		dge to write subjective and objective	Co	gniti	ve	Une	dersta	and
	lescriptions							
	<i>dentify</i> and contexts.	use their skills effectively in formal	Co	gniti	Und	lersta	nd	
SYLLAB	US						HOU	U R
UNIT-I	POETRY	Ζ				6	+3+0	=9
1.2 Stil		em in Indian English - Nissim Ezekiel aya Angelou ennyson						
		ee - Gieve Patel						
UNIT-II	PROSE					6	+3+0	=9
		ong Admit it- Dale Carnegie Please - Shashi Tharoor						
		Age- W.R. Inge						
UNIT-III	FICTION					6	+3+0	=9
Alc	chemist - Pa	ulo Coelho						
UNIT-IV	LANGU	AGE COMPETENCY				6	+3+0	=9
4.1 Ho	monyms, He	omophones, Homographs						
	anteau word							
		es, Subject Verb Agreement						
	or correction							
UNIT - V	ENGLIS	H FOR WORKPLACE				(5+3+	0=9
		neral and Specific Information [charts, tables, sch	edules	s, gra	phs	etc]		
	<u> </u>	and weather reports						
	iting paragra	*						
5.4 Tal	king and ma		7	- 4 - 1	TT		45	
		L=30 / T=15		otal	Ηοι	irs	45)
Futorial A		derstanding incomplete texts						
	-	derstanding incomplete texts						
	nmunication	Practice						
8) Rol								
0) KU	e piay							

Textbooks

- Coelho, Paulo. The Alchemist. Harper ,2016
- Chambers, Pearson.Brilliant Speed Reading: Whatever you need to read, however ...Phil, 2013
- Hewings, Martin. Advanced English Grammar. Cambridge University Press, 2000
- Sharma, Richa Descriptive English. Arihant Publications (India) Ltd, 2019

E- Resources:

- Very Indian poem by Nissim Ezekiel
- http://econtent.in/pacc.in/admin/contents/40_%20_2020103001102714.pdf
- Still I Rise by Maya Angelou https://www.poetryfoundation.org/poems/46446/stilli-rise
- Kindly Adjust please Shashi Tharoor
- https://www.theweek.in/columns/shashi-tharoor/2018/05/25/kindly-adjust-to-ourenglish.html?fbclid=IwAR3IhtdXqvuV4ySECn9S7SA6HmCEYISyd1QHd3BlwKg iNKKwdkeSg3qWp-U/
- The Alchemist: https://www.youtube.com/watch?v=lxBYpmxjeDU

CO	URSE NA	MF	Analytical Geo	motry 3_) and Integral	L	Т	P	С				
CO			, and the second s	Calculus	b and megrai	L							
CO	URSE CC	DE		XMT203		3	1	0	4				
С	Р	Α				L	Т	P	Н				
4	0	0				3	1	0	4				
PREREC	QUISITE		2D and 3D Shapes	& Basic I	ntegration Formul	ae							
On succe	essful com	pletion of	this course, the stu	dents wil	l be able to:								
		CO	URSE OUTCOME	S		DOMA	IN	LE	VEL				
CO 1	Find the	equation t	angent plane to a give	ven sphere	•	Cognitiv	ve	Reme	nbering				
CO 2	CO 3Apply the properties of definite integral to find reductionCognitiveApplying												
CO 3	formulae for a given integral.CognitiveHppfyingCO 4Examine the relation between beta and gamma function and alsoCognitiveAnalyzing												
CO 4Examine the relation between beta and gamma function and also find recurrence for gamma function.CognitiveAnalyzingCO 5Utilize the change of order of integration to obtain area the givenCognitiveApplying													
find recurrence for gamma function.													
		U						9) + 3				
	angent pla	ane- inters	ection of two sphere	s – Equat	on of tangentplane	etoasphere	•						
UNIT 2		2		~ ~			~ 11) + 3				
The equa Cylinder.		irface – c	one- Right Circular	Cone- T	angent plane and	normal –	Cylinc	ler- Er	veloping				
UNIT 3								9) + 3				
Propertie	sofdefinite	$\frac{1}{n} a^{ax} \cos^{2} a^{ax}$	Reduction formulaeo $uxdx$, $\int sin^n x dx$, $\int dx$	fthetypes: $\int \cos^n x dx$	$\int \sin^m x \cos^n x$	dr (tan	^l vdv						
UNIT 4	ur, jr	e 1030	ιλάλ, j Stit λάλ, j	τος τα.	i, j sin xcos x	ux, j tun	лил.	9) + 3				
			Definitions – Conve	-		e formula	of ga	nma fi	unction -				
-	s of beta f	unction – 1	relation between beta	a and gam	ma functions.								
UNIT 5	integral. T	ouble int	egral – Evaluation of	of double	integral change	of order o	finta		$\frac{1+3}{Polar}$				
1	0		- Application of mu		0 0		n meş	siation	- 1 01al				
	FURE	45	TUTORIAL	15	PRACTICAL	0	TOT	AL	60				
Text Boo	k												
Unit I - C Unit II - C 2. Calcu Unit III -	Chapter 4 Chapter 5 Ilus Vol III Chapter 1 Chapter 7 Chapter 5	Sec: 1 – Sec: 1 – T.K. M. 1 Sec: 11, Sec: 2 –	II – Three Dimensio 8 (pages:92 -111) 8 (pages :115-139) Pillai, 2015 (for Unit 13.1 – 13.6 (pages: 5 (pages 278-290) – 5.4(pages 203-231)	t III, IV & 66-72,79-	V)	r Unit I, II)						

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3. AncillaryMathematics,T.K.M.Pillai,P.Natarajan, S. Viswanathan (Printers & Publishers) Pvt Ltd. 1992.

E-References

- 1. <u>https://sites.math.washington.edu/~m125/</u>[WashingtonUniversity]
- 2. <u>https://courses.maths.ox.ac.uk/node/28[</u>OxfordUniversity]

COs VS POs											
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 1	2	1	0	0	0	1	1	1	2	1	0
CO 2	2	1	0	0	0	1	1	1	2	1	0
CO 3	3	3	2	0	1	3	3	3	3	3	0
CO 4	3	3	3	1	2	3	3	3	3	3	1
CO 5	3	3	2	0	1	3	3	3	3	3	0
TOTAL	13	11	7	1	4	11	11	11	13	11	1
SCALED VALUE	3	3	2	1	1	3	3	3	3	3	1
0 - No Relation, 1 -	Low Re	lation, 2	2- Medi	ium Re	lation, 3	3- High	Relatio)n	I	I	1

1-5→1, 6-10→2, 11-15→3

COURSE NAME			Seque]	Ĺ	Т	Р	C				
CO	URSE CO	DE			XMT204			3 1 0		0	4	
С	Р	Α					1	L	Т	Р	Н	
4	0	0						3	1	0	4	
PRERE	QUISITE		Alg	gebra and Numb	ber System	5						
On succe	essful com	pletion o	of this	course, the stu	idents will	be able to:						
		CO	OURS	SE OUTCOME	ES		DO	MAIN		LEV	EL	
CO1 Demonstrate if an infinite sequence is bounded, monotonic or oscillating.								gnitive	U	Understanding		
CO 2			-			convergent or	Cog	Cognitive		Understanding		
				appropriate tests		or divergent by				ndersta	ndina	
CO 3						or divergent by or divergent's root		gnitive		nuersta	namg	
CO 4		the seque	ence o	f partial sum fo	r a given ir	finite series.	Cog	gnitive		Applying		
CO 5										Understanding		
UNIT 1		- 1	- J -				1		I	9+	3	
				per and lower b	oounds – E	Bounded sequenc	es - m	onotoni	c sec	uence	always	
	a limit, fini	te or infi	nite.									
UNIT 2						of positive terms				9 +		
						of convergence						
						-p and Geometric		-				
UNIT 3										9 +	3	
2				ple problems -	Raabe's t	est – Absolutely	conve	ergent s	eries	- Alte	rnative	
	th simple p	problems.								0.	2	
UNIT 4 Summati	on of serie	s _ Sumr	natior	n by different se	ries _ rec	urring series				9 +	3	
UNIT 5		5 Juill	1141101			unning series.				9+	3	
	es- Geome	etric and	Arithr	netic means- W	eirstrass in	equalities- Cauch	ny's ine	equality	7.		•	
	CTURE		45	TUTORIAL	15	PRACTICAL	0		TAL		60	
Text Boo	oks											
Publis Unit I :	hers) Pvt. I Chapter 2	Ltd., 2013 (Sec: 4 –	5. 7), Pa	ages: 20 - 40 Pages: 41 - 68	urajan and : 68 - 88	K.S.Ganapathy,	S. 7	Viswan	athar	n (Prin	ters &	

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COs VS POs											
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	2	1	0	0	2	2	2	3	2	0
CO 4	3	3	2	0	1	3	3	3	3	3	0
CO 5	3	2	1	0	0	2	2	2	3	2	0
TOTAL	15	11	6	0	1	11	11	11	15	11	0
SCALED VALUE	3	3	2	0	1	3	3	3	3	3	0

 $1 ext{-} 5 ext{-} 1, 6 ext{-} 10 ext{-} 2, 11 ext{-} 15 ext{-} 3$

(COUI COI			COURSE NAME	L	T	Р	C		
	XPG	205			3	0	0	3		
С	P	A		ALLIED PHYSICS -II	L	Т	Р	H		
2.7	0	0.	3		3	1	0	4		
				OMES ompletion of this course students would a	ble to	<u> </u>	1	1		
				To understand the basic concepts of	DOMA	IN]	LEVEL		
optics, modern Physics, concepts of relativity and quantum physics, semiconductor physics, and electronics.										
СС	01	<i>Expl</i> diffra polar	acti	1	Cognit	ive		lerstanding analyze		
СС)2	mode inter	els pret	the basic foundation of different atom and <i>Relate</i> the importance of ing improving theoretical models n observation.	Cognit	ive		nembering lerstanding		
CC)3	force mode fissio	es s els. on a	<i>rize</i> the properties of nuclei, nuclear tructure of atomic nucleus and nuclear <i>Interpret</i> nuclear processes like and fusion. <i>Understand</i> the importance ar energy, safety measures.	Cognit	ive		nembering, lerstanding apply		
СС)4	equiv	ale	e the basic concepts of relativity like ence principle, inertial frames and transformation.	Cognit	ive		nembering, lerstanding apply		
CO	95		es,	<i>ize</i> the working of semiconductor Zener diode, transistors and practical	Cognit	ive		nembering lerstanding		
UNI	T – I	0	PT	ICS				9 + 3		
diam incid polar appli UNI	heter lence rizatio icatio T – I	of a th – exp on – n in su I A	nin erin pol igan TC	ference in thin films –colors of thin film wire by air wedge – diffraction – diffra nental determination of wavelength using arization by double reflection – Brew industries.	ction of g diffract vster's la	light ion g aw –	vs so rating optic	und – norma (no theory) – cal activity – 9+3		
	Atom models – Bohr atom model – mass number – atomic number – nucleons – vector atom model – various quantum numbers – Pauli's exclusion principle – electronic configuration –									

ideas only) – photo electric effect – Einst photoelectric effect: solar cells, solar panels, o	ntoelectric devi	ces						
UNIT – III NUCLEAR PHYSICS		ees	9 + 3					
Nuclear models – liquid drop model – magic	numbers _ shel	1 model – nucles						
defect – binding energy – radioactivity – uses								
controlled and uncontrolled chain reaction $-n$			-					
reaction – critical reaction – critical size- at								
importance of commissioning PFBR in our co								
seismic and floods –introduction to DAE, IA	EA – nuclear It	ision – thermonu	clear reactions					
differences between fission and fusion.								
UNIT – IV INTRODUCTION TO RELA			9 + 3					
GRAVITATIONAL WAVES								
Frame of reference – postulates of special t								
equations - Lorentz transformation equation		-						
dilation - twin paradox - mass-energy equiv		U U	ational waves,					
LIGO, ICTS opportunities at International Cer	tre for Theoreti	cal Sciences.						
UNIT – V SEMICONDUCTOR PHYSICS								
UNIT – V SEMICONDUCTOR PHYSIC	CS		9 + 3					
p-n junction diode – forward and reverse bi		eristic of diode						
	asing – charact		– zener diode					
p-n junction diode – forward and reverse bi	asing – charact or – full wave b	oridge rectifier –	– zener diode construction an					
p-n junction diode – forward and reverse bi characteristic of zener diode – voltage regulat	asing – charact or – full wave b	oridge rectifier –	– zener diode construction an					
p-n junction diode – forward and reverse bi characteristic of zener diode – voltage regulat working – advantages (no mathematical treats e-vehicles and EV charging stations	asing – charact or – full wave b	oridge rectifier –	– zener diode construction an					
p-n junction diode – forward and reverse bi characteristic of zener diode – voltage regulat working – advantages (no mathematical treat	asing – charact or – full wave b nent) – USB ce	oridge rectifier – ll phone charger	 zener diode construction an introduction t 					
p-n junction diode – forward and reverse bi characteristic of zener diode – voltage regulat working – advantages (no mathematical treats e-vehicles and EV charging stations	asing – charact or – full wave b nent) – USB ce LECTURE	ridge rectifier – ll phone charger TUTORIAL	 zener diode construction an introduction t TOTAL 					
p-n junction diode – forward and reverse bi characteristic of zener diode – voltage regulat working – advantages (no mathematical treatr e-vehicles and EV charging stations HOURS	asing – charact or – full wave b nent) – USB ce LECTURE 45	ridge rectifier – ll phone charger TUTORIAL 15	 zener diode construction an introduction t TOTAL 					
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Course Outcomes	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO9	PO10	PSO1	PSO2
CO1	3	0	1	0	1	3	1	2	1	2	2	1
CO ₂	2	0	1	2	1	3	1	1	1	2	2	1
CO ₃	2	1	3	3	1	3	2	1	0	2	1	1
CO ₄	1	1	2	3	2	3	1	2	0	2	2	2
CO ₅	2	1	1	3	1	3	1	2	1	2	1	1
Total	10	3	8	11	6	15	6	8	3	10	8	6
Scaled to 1, 2, 3	2	1	2	3	2	3	3	2	1	2	2	2

Mapping with Programme Outcomes

0 - No relation

1 - Low relation 2 - Medium relation

3 – High relation

COU	URSE (CODE	COURSE NAME	L	Т	Р	С		
	XPG2)6		0	0	1	1		
С	Р	Α	ALLIED PHYSICS PRACTICAL – II	L	Т	Р	Н		
0	0.75	0.25		0	0	2	2		
COU	URSE (DUTCO	OMES						
On t	he succ	essful co	ompletion of this course students would able to						
			Apply various Physics concepts to understand						
	-	-	electricity and magnetism and waves, set up	Don	nain	L	evel		
-			verify theories, quantify and analyse, able to do						
			orrelate results						
CO			<i>t</i> basic concepts of physics and <i>identify</i> its	Psych	omoto	Mec	hanism		
	app	olication	S	1	r				
CO		••	e principles of optics, and <i>determine</i> refractive	Psych	omoto	Analyze,			
	ind	ex.		r: Affective:		Re	spond		
CO.		-	<i>nowledge</i> to differentiate resistance of material temperature.	Psych	omoto ::	Mec	hanism		
				Affe	ctive:	Re	ceive		
CO			concepts of laws and <i>explain</i> the methods of	Psych	omoto	Mec	hanism		
	ma	gnetic fi	eld.	-	ective:				
CO			<i>I</i> function of semiconductor and zener diode and	Psych	omoto	oto Analyze			
	how	v 1t 1s w	orking regulator.	r: Affe	ective:	Re	ceive		

Any Eight of the experiments

Ex. No	Experiments (Any eight experiments)	Cos
1.	Radius of curvature of lens by forming Newton's rings	CO1
2.	Thickness of a wire using air wedge	CO1
3.	Wavelength of mercury lines using spectrometer and grating	CO1
4.	Refractive index of material of the lens by minimum deviation	CO2
5.	Refractive index of liquid using liquid prism	CO2
6.	Specific resistance of a wire using PO box	CO3
7.	Thermal conductivity of poor conductor using Lee's disc	CO3
8.	Determination of Earth's magnetic field using field along the axis of a	CO4

	coil							
9.	9. Characterisation of Zener diode							
10.	10. Construction of Zerner/IC regulated power supply							
11.	Construction of AND, OR, NOT gates u	sing diodes and	transistor	CO5				
12.	12. NOR gate as a universal building block							
		LECTURE	PRACTICAL	TOTAL				
	HOURS	0	30	30				

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Mapping of COs with POs

Course Outcomes	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO9	PO10	PSO1	PSO2
CO ₁	1	1	3	3	2	3	1	3	0	1	2	1
CO ₂	1	1	3	2	1	3	1	3	1	1	2	1
CO ₃	1	1	3	3	1	3	2	3	1	2	2	1
CO ₄	1	1	2	2	2	3	1	3	1	2	2	1

C	05	1	1	3	3	2	3	1	3	1	2	2	2	1
То	tal	5 :	5 1	14	13	8	15	6	15	4	8	1	0	5
Scale 1, 2		1	1	3	3	2	3	2	3	1	2		2	1
	0 – No rež	lation		1 –	Low re	lation	2	– Mediu	m relatio	on	3 – 1	High re	lation	
CO	URSE NA	AME			Qı	antita	tive Ap	otitude –	·I		L	T	P	С
CO	URSE CO	ODE				2	XMT20	7			1	1	0	2
С	Р	A									L	Т	Р	H
2	2 0 0										1	1	0	2
PRERE	QUISITE	;	N	lumb	per Syst	ems								
On succe	essful con	npletio	on of th	is co	ourse, t	he stu	dents w	vill be ab	le to:					
			COUR	RSE	OUTC	OMES	5			D	OMAI	I N	LEV	EL
CO 1	Explain Number				-		ers, H.	C.F. &	L.C.M	of C	ognitiv	/e 1	Underst	anding
CO 2	Explain and to so	the ba	asic co	ncep	ts of D		Fractio	ons, Sim	plificatio	on C	ognitiv	ve 1	Underst	anding
CO 3	Explain Average						e Root	s & Cu	be Root	ts, C	ognitiv	ve I	Underst	anding
CO 4	Explain Problem							Numbe	ers,	C	ognitiv	ve I	Underst	anding
CO 5	Explain solve the			icept	ts of Su	rds &]	Indices,	Percent	age and	to C	ognitiv	ve I	Underst	anding
UNIT 1										I				3+3
	, H.C.F. &	&L.C.N	A of Nu	ımbe	ers.								<u> </u>	
UNIT 2	Eroction -	Cimal	ficati											3+3
UNIT 3	Fractions	, Simpl	micatio	DII.										3+3
Square R	oots & Ci	ube Ro	ots, Av	verag	ge.								ı	
UNIT 4		Dama D	nobler:		1 000									3+3
	s on inumi	Jers, Pr	lobiem	s on	Ages.									3+3
														-
Problems U NIT 5 Surds & I	Indices, Po	ercenta	ige.											

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				CO	s VS PO	Os					
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	2	1	0	0	2	2	2	3	2	0
CO 4	3	2	1	0	0	2	2	2	3	2	0
CO 5	3	2	1	0	0	2	2	2	3	2	0
TOTAL	15	10	5	0	0	10	10	10	15	10	0
SCALED VALUE	3	2	1	0	0	2	2	2	3	2	0
0 - No Relation $1 - 1$	Low Do	lation ') Mod	um Do	lation	2 IIiah	Deletic		•	•	•

0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation

 $1\textbf{-}5 {\rightarrow} 1, 6\textbf{-}10 {\rightarrow} 2, 11\textbf{-}15 {\rightarrow} 3$

		SEMESTER II		L	Т	Р	SS	C
COUR	SE CODE	XUM002		1	0	0	1	1
	SE NAME	ENVIRONMENTAL STUDI	ES	L	T	P	SS	Н
C: P: <i>A</i>		0.8:0.1:0.1		1	0	0	1	2
COUR	SE OUTCOM		Domain			-	Leve	l
CO1		significance of natural resources and pogenic impacts.	Cognitive	,			emem ndersta	
CO2	<i>Illustrate</i> the	significance of ecosystem, biodiversity eo bio chemical cycles for maintaining	Cognitive)			ndersta	
CO3	••	acts, consequences, preventive measures ollutions and <i>recognize</i> the disaster	Cognitive Affective				emem ¹ eceivi	
CO4	<i>Explain</i> the and <i>practice</i> the sustainable de	ne control measures of global issues for	Cognitive	•			ndersta Analys	
CO5	various welf	e impact of population and the concept of are programs, and <i>apply</i> themodern wards environmental protection.	Cognitive Psychomot				ndersta Apply	
UNIT -	- I NATURAI	L RESOURCES AND ENERGY					3+3	
UNIT S	ndividual in Co - IIECOSYST tructure and fu ycles- Food cl	wable and Non-renewable energy sources nservation of Resources. EMS AND BIODIVERSITY nction of an ecosystem – Producers, consumations, Food webs, Structure and Function oduction to Biodiversity- Endemic, Extinct	mers and deco n of the Fores	ompos st eco	sers –	Bioge m an	3+3 ochen d Aqu	nica
	•	In-situ and Ex-situ conservation.	8		I			
		NMENTAL POLLUTION					3+3	
N m	farine pollutionanagement: Ca	uses, effects and control measures of Air p on, Noise pollution, Thermal pollution auses, effects and control measures of ind llution – Pollution case studies	and Nuclear	haz	ards	– Sc	olid v	vaste
		SSUES AND THE ENVIRONMENT					3+3	
W	varming, Acid	vesting– Resettlement and Rehabilitation rain, Ozone layer depletion, Nuclear and Water Act – Wildlife Protection Act – For	ccidents and 1	Holo	caust			
		OPULATION AND THE ENVIRONME					3+3	
h		oth, Variation among nations - Populatio IDS – Role of Information Technology in	-					

LECTURE	TUTORIALS	PRACTICALS	TOTAL						
30	0		30						
TEXT BOOKS									
1. Miller T.C	J. Jr., Environmental Science	e, Wadsworth Publishing Co,	USA, (2000).						
2. Townsend	l C., Harper J and Michael B	egon, Essentials of Ecology,	Blackwell Science, UK,						
(2003).									
3. Trivedi R.	K and P.K.Goel, Introduction	on to Air pollution, Techno So	cience Publications,						
India, (20									
	0 1	covery and Response, SBS Pu	blishers & Distributors						
	Pvt. Ltd, New Delhi, (2006).								
		nanagement, Butterworth Hei							
		vironmental Engineering and	l Science, Pearson						
	Pvt., Ltd., Second Edition,	New Delhi, (2004).							
REFERENCES									
1. Trivedi R.	K., Handbook of Environme	ental Laws, Rules, Guidelines	S. Compliances and						
	, Vol. I and II, Enviro Media		, F						
		ini, Environmental Encyclope	edia, Jaico Publ., House,						
Mumbai,	-								
3. S.K.Dham	ieja, Environmental Engine	ering and Management, S.K.H	Kataria and Sons, New						
Delhi, (20	12).								
4. Sahni, Dis	saster Risk Reduction in Sou	th Asia, PHI Learning, New	Delhi, (2003).						
	isaster Management, Sarup								
	<u> </u>	P.H.Publishers, New Delhi, (2006).						
E RESOURCES									
-	w.e-booksdirectory.com/deta	1 1							
		troduction-to-Environmental	-Science						
-	ww.free-ebooks.net/ebook/W	•							
1	ww.learner.org/courses/envso	1 1							
-	kboon.com/en/pollution-pre								
-	w.e-booksdirectory.com/det	1 1							
-	w.e-booksdirectory.com/det								
_	kboon.com/en/atmospheric-	=							
	w.e-booksdirectory.com/det								
	w.e-booksdirectory.com/det								
1	•	sdirectory.com/details.php?ebook=2116 sdirectory.com/details.php?ebook=1026							
1	•	1 1	on 00						
15. http://ww	w.raauooengineers.com/thre	ads/7894-Environmental-Sci	ence						

SEMESTER III

பொதுத்தமிழ் - 3

பாடக் குறியீ டு/ Course Code	பாடப்பெயர்/ Course Name	Category	L	Т	Р	SS	H	С	
XGT301	பொதுத்தமி ழ் - 3	Supportive	3	0	0	0	3	3	
Pre- requisite	பன்னிரெண்ட வேண்டும்.	ாம்வகுப்பில்த	மிழை	ஒருபா	டமாக	கப்பப	ின்றிரு	க்க	
பாடப்ப யன்க ள் Course outcomes	இப்பாடத்தைல டைவர்.	க்ற்பதால்பின்	ாவரும்	பயன்	களை	பான	ரவர்கள்	୬	
CO1	தமிழ்க்காப்பிய யைப்பெறுவர்	0	வாழ்வி	பியல்ச ்	<u>)ந்</u> தன	តា	புரிந்த ள்ளல் (Under		
CO2	காப்பியங்கள், ழியின்உயர்ன		• •	•		ழமை	ா புரிந்த ள்ளல் (Under		
СОЗ	தமிழ்ப்புதினந் வாழ்வியல்சி	•				ளின்	பகுப்	பாய் ய்தல்	
CO4	நாவல்இலக்கி தனைஆற்றல் கற்பனைத்திற),		ப்படுவ படைப்	•		தெரிந்த ள்ளல் (Apply)	தகா	
CO5	யாப்பு, அணிஇலக்கணங்கள், புரிந்துகொ மொழிபெயர்ப்புத்திறன்ஆகியவற்றைக்கற்பதன்மூ ள்ளல் லம்போட்டித்தேர்வுகளைஎதிர்கொள்ளுதல் (Understand) K1- Remember; K2 – Understand; K3 – Apply; K4 Analyze; K5								

	Evaluate; K6 – Create.	
அலகு -	பெருங்காப்பியங்கள்	9மணிகள்
Ι		
	சிலப்பதிகாரம் - வழக்குரைகாதை –	
	இளங்கோவடிகள்மணிமேகலை -	
	ஆதிரைபிச்சையிட்டகாதை –	
	சீத்தலைச்சாத்தனார்சீவகசிந்தாமணி -	
	பூமகள்இலம்பகம் – திருத்தக்கதேவர்வளையாபதி -	
	நாதகுத்தனார்	
அலகு -	சித்தர்பாடல்கள்	9 மணிகள்
II		
	திருமூலர்பாடல்கள் (10 பாடல்கள்)	
	கரூர்சித்தர்பாடல்கள் (10 பாடல்கள்) –	
	பாம்பாட்டிச்சித்தர்கள் - (10 பாடல்கள்)	
	குதம்பைச்சித்தர்கள் - (10 பாடல்கள்)	
அலகு -	புதினம்	9மணிகள்
III		
	வஞ்சிமாநகரம் (வரலாற்றுப்புதினம்) -	
	நா.பார்த்தசாரதி	
அலகு -	பாடம்தழுவியஇலக்கியவரலாறு	9மணிகள்
IV		
அலகு -	மொழித்திறன்	9மணிகள்
V		
	1. நூல்மதிப்புரை	
	2. திறனாய்வுசெய்தல்	

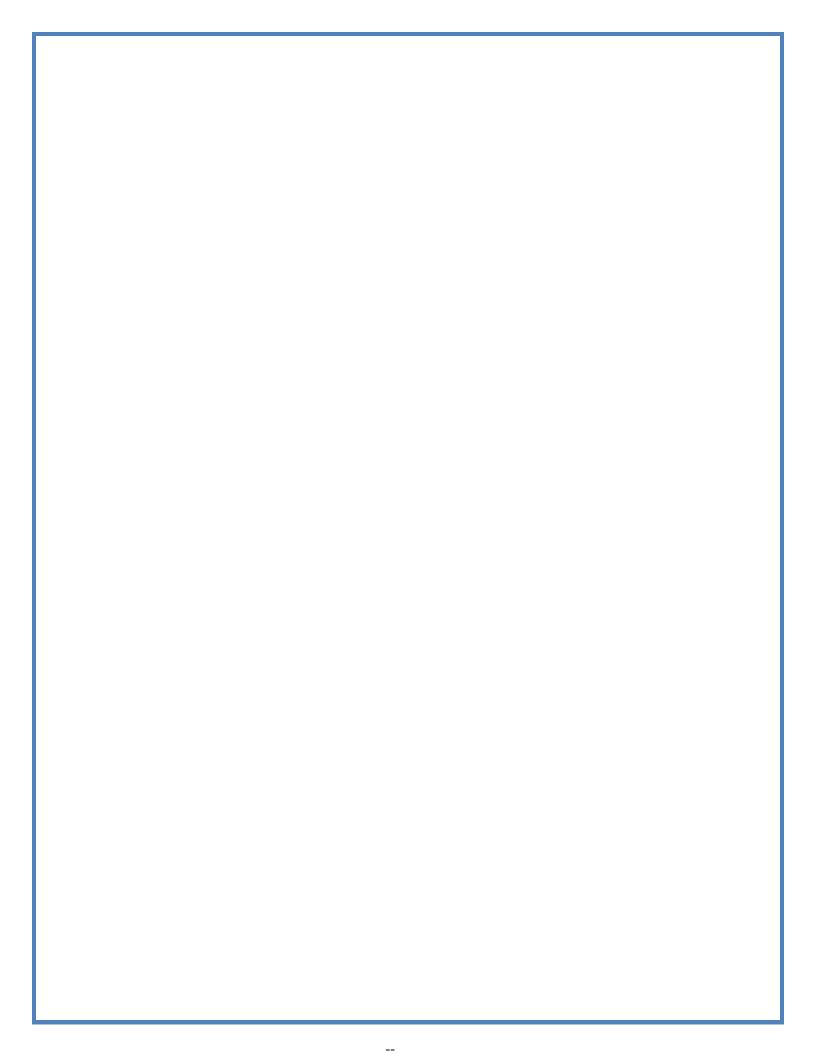
	• •	
	3. கடிதம்வரைதல்	
	 விண்ணப்பம்எழுதுதல் 	
	Total Lecture Hours	45மணிகள்
பாடநூ	ல்கள்	
1.	சிலப்பதிகாரம், கழகவெளியீடு, சென்னை	
2.	மணிமேகலை, கழகவெளியீடு, சென்னை	
3.	சீவகசிந்தாமணி, கழகவெளியீடு, சென்னை	
4.	சித்தர்பாடல்கள், பாரிநிலையம், சென்னை	
பார்னை	பநூல்கள்	
1.	தமிழ்இலக்கியவரலாறு –	
	சிற்பிபாலசுப்பிரமணியன்.	
2.	புதியநோக்கில்தமிழ்இலக்கியவரலாறு -	
	தமிழண்ணல்	
3.	வகைமைநோக்கில்தமிழ்இலக்கியவரலாறு –	
	எஃப்.பாக்கியமேரி.	

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

Web Sources

- Tamil Heritage Foundation -www.tamilheritage.org<http://www.tamilheritage.org>
- Tamil virtual University Library www.tamilvu.org/library http://www.virtualvu.org/library
- Project Madurai www.projectmadurai.org.
- Chennai Library www.chennailibrary.com<http://www.chennailibrary.com>.
- Tamil Universal Digital Library-www.ulib.prg<http://www.ulib.prg>.
- Tamil E-Books Downloads tamilebooksdownloads.blogspot.com
- Tamil Books online books.tamilcube.com
- Catalogue of the Tamil books in the Library of British Congress archive.org
- Tamil novels online books.tamilcube.com

Strong-3, Medium-2, Low-1



COU	RSE CODE	XGE302	L	Τ	P	SS	Η	C
COU	RSE NAME	ENGLISH III	3	0	0	0	3	3
C:P:A	- 3:0:0				11			
COUR	RSE OUTCOM	TES:	D	oma	in	Ι	Level	l
		of course, the learners will be able to get						
-	ehensive skills							
CO1		ir outlook and sensibility and be	Co	gnit	ive	Un	derst	and
	-	vith cultural diversity and divergence in						
GOA	perspectives		0	•			. 1	
CO2		with basic informatics skills and attitudes	Co	gnit	ive	ŀ	Apply	У
CO3		ne emerging knowledge society mmatically and idiomatically correct language.	Co	anit		Und	lersta	md
			_	gnit				
CO4		edge in writing techniques to meet	Co	gnit	ive	Un	derst	and
005		d professional needs.	0	• .		TT	1 4	1
CO5	Be equipped	with sufficient practice in Vocabulary,	Co	gnit	ive	Un	derst	and
		omprehension and Remedial English from ive of career oriented tests.						
SYLL		we of career offented tests.					HO	
UNIT		V				6	+3+(
						- 0	1510)_/
	Sita - Toru Du	he Mountains - Mamang Dai						
		pe - Oodgeroo Noonuccal						
		Studio - Christina Rossetti						
UNIT		FROM SHAKESPEARE				6	+3+()=9
2.1	Romeo & Julie	t -The Balcony Scene						
	Macbeth-Banqu	•						
2.3	Julius Caesar -	Murder Scene						
UNIT	-III SPEECH	ES OF FAMOUS PERSONALITIES				6	+3+()=9
3.1	Tryst with Dest	iny- Jawaharlal Nehru						
3.2	Yes, We Can-l	Barack Obama						
3.3		Find What You Love-Steve Jobs						
UNIT	-IV LANGU	AGE COMPETENCY				6	+3+()=9
	Writing letters							
4.2	0	essaging in social media platforms						
		instagram. facebook]						
		iette, email etiquette						0.0
		H FOR WORKPLACE					6+3+	0=9
		tion and Reporting						
		on and analysis						
		ttes - language, dress code, voice modulation.						
		s - Terms and expressions used						
J.4 1	conducting and	l participating in a meeting L=30 / T=15	7	1.4.1	Hou		4	_

CC	URSE NA	ME	Differential Equ	lations an	d Applications	L	Т	Р	C
CC	OURSE CC	DE		XMT303		3	3 1 L T 3 1 3 1 OOMAIN Image: Cognitive Cognitive Rei Cognitive Rei Cognitive Image: Cognitive Image: Cognitive Image: Cognitive Cognitive Image: Cognitive Image: Cognitive Image: Cognitive		4
С	Р	Α				L	Т	Р	Н
4	0	0				3	1	0	4
PRERE	QUISITE		Differential Calculu	us					
	-	pletion of	 f this course, the stu		be able to:				
		-	URSE OUTCOMES			DOMA	IN	LEV	EL
CO 1		t rate the	solutionsof homo ationsofdegreeoneinty	geneous	-			Understa	
CO 2	Find the degree an	solutions	of equations of first nine particularintegra ionsandtheirproducts	st order bu alsofalgebu	ut not of higher	Cognitiv	e	Remem	bering
CO 3	Find so	lutions of ationsof	f simultaneous line seco usingthemethodof va	ar differe ond	order	Cognitiv	e	Remem	bering
CO 4		•	inatingarbitraryconsta		•	Cognitiv	e	Apply	ving
CO 5			equations using Char			Cognitiv	e	Apply	ving
UNIT 1	Ordinar	y Differer	ntial Equations					9 -	- 3
Variable			eousEquation - Non	-Homoger	neous Equations	of first deg	gree in	two var	iables
			Equation - Exactdiffer						
			order but not of high					9 -	
Equation			- Equation solvable officients-Particular in						
	1	neous line	ear differential equa	tions				9 -	- 3
			econd Order - C		solution in ter	ms of a	know		
Reduction	ontotheNor	malform -	ChangeoftheIndeper	ndentVaria	uble - MethodofV	ariationof	Parame	ters.	
UNIT 4	Partial d	lifferentia	al equation					9 -	- 3
			nating arbitraryconst			s – compl	ete inte	gral – s	ingula
			grange'sLinearEquati	ons– Sim	pleApplications.				
			d equation	<u> </u>	1			9-	- 3
_			ns–Charpit'sMethods	-		0	ТОТ	AT	()
	CTURE	45	TUTORIAL	15	PRACTICAL	U	101/	AL	60
Text Bo	ok								
1. Diff		rinters – C	and its application Thennai, .2009. ns 1- 6	ons, S. N	larayanan, T. K	. Manick	avachag	am Pil	lay, S
Visv Unit I :	-		ns $1 - 3 - 1 - 4$						
Visv Unit I : Unit II :	Chapter 2 Chapter 4, Chapter 2	5 Section	ns $1 - 3$, $1 - 4$ ns $1 - 4$						

Unit V: Chapter 12 Sections 5-6

References

- 1. DifferentialEquations,ShepleyL.Ross,3rdEd.,JohnWileyandSons,1984.
- 2. Elements of Partial Differential Equations, I. Sneddon, McGraw-Hill, InternationalEdition, 2013.
- 3. G.F. Simmons, Differential equations with applications and historical notes, 2ndEd,Tata McGrawHill Publications, 2017.

E-References

- 1. http://science.korea.edu/science_en/undergraduate/under_math3.do
- 2. http://scinece.utm.my/ug/course_list_old/sscm1703/
- 3. http://nptel.ac.in

				CO	s VS P	Os					
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	2	1	0	0	0	1	1	1	2	1	0
CO 3	2	1	0	0	0	1	1	1	2	1	0
CO 4	3	2	1	0	0	2	2	2	3	2	0
CO 5	3	2	1	0	0	2	2	2	3	2	0
TOTAL	13	8	3	0	0	8	8	8	13	8	0
SCALED VALUE	3	2	1	0	0	2	2	2	3	2	0

 $1\textbf{-}5 {\rightarrow} 1, 6\textbf{-}10 {\rightarrow} 2, 11\textbf{-}15 {\rightarrow} 3$

CO	URSE NAI	ME	Vector Calcu	lus and	Applications	L	Т	Р	С
CO	URSE CO	DE		XMT304		3	1	0	4
С	Р	A				L	Т	Р	Н
4	0	0				3	1	0	4
PREREC	QUISITE	Dit	fferential and int	egral calc	ulus	-			
On succe	essful comp	pletion of this	s course, the stu	dents wil	l be able to:				
		COURS	E OUTCOMES	S		DOMAI	N	LEV	EL
CO 1			vector, derivativ vector product.	e of a sca	lar and derivative	Cognitiv	ve I	Remem	bering
CO 2	Find grad	lient of a scala	ar, Divergence an	nd Curl of	a vector.	Cognitiv	ve	Apply	ving
CO 3	Solvesim	olelineintegra	ls.			Cognitiv	'e	Apply	ving
CO 4	Solvesurf	aceintegralsar	dvolumeintegra	ls.		Cognitiv	ve 🛛	Apply	ving
CO 5	Analyzeth (TwoDim		Gauss,Stoke'san	dGreen's		Cognitiv	ve 🛛	Apply	ving
UNIT 1		,						9 -	
Derivativ UNIT 2 The vector	re of a prod	uct of a scalar "del", The gr	and avectorpoir	ntfunction	e of a vector andd -Derivative ofasca nction - Divergenc	larproduct	andvec	torprod 9 -	uct. - 3 vector -
	l noperator,V	ectoridentitie	s-Lineintegral-si	mpleprot	lems.			91	- 3
UNIT 4								9 -	- 3
Surface in UNIT 5	ntegral - Vo	olume integra	l – Applications.					9 -	_ 3
	ergenceThe	orem,Stoke's	Theorem,Green'	sTheoren	nintwo dimensions	_			0
. .		fesituations.	TUTODIAL	15		0	тот	T	()
	TURE	45	TUTORIAL	15	PRACTICAL	0	ΤΟΤΑ		60
Text Boo									
U U U U	nit I : Cha nit II : Cha	pter 2 Sect pter 2 Sect pter 2, 3 Sect pter 3 Sect	an,LaxmiDuraiPa ions2.1, 2.2., 2.3 ions2.4, 2.5, 2.6, ions2.8, 3.1, 3.2, ions3.5, 3.6 ctions4.2, 4.3, 4.4	2.7 3.3., 3.4	neraldPublishers20)17.			
Reference	ces								
1. Vecto	orCalculus,.	J.C.Susan,(4th	nEdn.)PearsonEc	lucation,F	Boston,2012.				

- VectorCalculusforCollegeStudents,A. Gorguis,XilbiusCorporation,2014.
 Vector Calculus, J.E. Marsden and A. Tromba (5thedn.) W.H. Freeman, NewYork,1988.

E-References

http://mathforum.org,

http://www.opensource.org

http://nptel.ac.in

				CO	s VS P	Os					
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 1	2	1	0	0	0	1	1	1	2	1	0
CO 2	3	3	2	0	1	3	3	3	3	3	0
CO 3	3	3	2	0	1	3	3	3	3	3	0
CO 4	3	3	2	0	1	3	3	3	3	3	0
CO 5	3	3	2	0	1	3	3	3	3	3	0
TOTAL	14	13	8	0	4	13	13	13	14	13	0
SCALED VALUE	3	3	2	0	1	3	3	3	3	3	0
0 - No Relation, 1 –	Low Re	lation, 2	2- Medi	ium Re	lation,	3- High	Relatio	n	1	1	1

1-5→1, 6-10→2, 11-15→3

COURSE CODE XMT305 2 C P A IL 4 0 0 2 PREREQUISITE Basic Statistics 2 On successful completion of this course, the students will be able to: 2 COURSE OUTCOMES DOM CO 1 Demonstrate to understand basics of Data Science. Cogn CO 2 Classify the various types of data collection and pre-processing. Cogn GO 3 Identify measures of central tendency and dispersion for the given data set. Cogn CO 4 Construct the model development of simple and multiple regression. Cogn UNIT 1 Introduction Cogn Cogn Introduction to Data Science – Evolution of Data Science – Data Science Roles – S Project – Applications of Data Science in various fields – Data Science Roles – S Project – Applications of Data Science in various fields – Data Science Roles – S Project – Applications of Data Science in various fields – Data Science Roles – S Project – Applications of Data Analytics Descriptive Statistics – Mean, Standard Deviation, Skewness and Kurtosis–Correlatic UNIT 3 Exploratory Data Analytics Descriptive Statistics – Mean, Standard Deviation using Visualization – Residual I Polynomial Regression and Pipelines.		Т	P	C
4 0 0 2 PREREQUISITE Basic Statistics 00M On successful completion of this course, the students will be able to: COURSE OUTCOMES DOM CO 1 Demonstrate to understand basics of Data Science. Cogn CO 2 Classify the various types of data collection and pre-processing. Cogn CO 3 Identify measures of central tendency and dispersion for the given data set. Cogn CO 4 Construct the model development of simple and multiple cogn regression using visualization. Cogn CO 5 Analyzethe model selection and the prediction by using Cogn regression. Cogn UNIT 1 Introduction Introduction of Data Science – Evolution of Data Science – Data Science Roles – S Project – Applications of Data Science in various fields – Data Science Roles – S Project – Applications of Data Science in various fields – Data Science Roles – S Data Collection Strategies – Data Pre-Processing Data Collection and Data Pre-Processing Data Cleaning Transformation – Data Reduction – Data Discretization. UNIT 3 Exploratory Data Analytics Descriptive Statistics – Mean, Standard Deviation, Skewness and Kurtosis–Correlatic UNIT 4 Model Development Simple and Multiple Regression – Model Evaluation using Visualization – Residual I Polynomial Regression and Pipelines. UNIT 5 Model Develop		1	0	3
PREREQUISITE Basic Statistics COURSE OUTCOMES DOM COURSE OUTCOMES DOM CO 1 Demonstrate to understand basics of Data Science. Cogn CO 2 Classify the various types of data collection and pre-processing. Cogn CO 3 Identify measures of central tendency and dispersion for the given data set. Cogn CO 4 Construct the model development of simple and multiple cogn regression using visualization. CO 5 Analyzethe model selection and the prediction by using regression. UNIT 1 Introduction Introduction to Data Science – Evolution of Data Science – Data Science Roles – S Project – Applications of Data Science in various fields – Data Science Roles – S Project – Applications of Data Science in various fields – Data Science Roles – S Science in various fields – Data Cleaning Transformation – Data Reduction – Data Discretization. UNIT 3 Exploratory Data Analytics Descriptive Statistics – Mean, Standard Deviation, Skewness and Kurtosis–Correlatic UNIT 4 Model Development Simple and Multiple Regression – Model Evaluation using Visualization – Residual I Polyno		Т	Р	H
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COs VS POs												
]	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	
CO 1	3	2	1	0	0	2	2	2	3	2	0	
CO 2	3	2	1	0	0	2	2	2	3	2	0	
CO 3	3	3	2	0	1	3	3	3	3	3	0	
CO 4	3	3	2	0	1	3	3	3	3	3	0	
CO 5	3	3	3	1	2	3	3	3	3	3	1	
TOTAL	15	13	9	1	4	13	13	13	15	13	1	
SCALED VALUE	3	3	2	1	1	3	3	3	3	3	1	

 $1 ext{-} 5 ext{-} 1, 6 ext{-} 10 ext{-} 2, 11 ext{-} 15 ext{-} 3$

CO	URSE NA	ME	Statistics for Data Science Lab I using R Programming	L	Т	Р	C	
CC	OURSE CO	DDE	XMT306	0	0	2	1	
С	P	A		L	Т	Р	Н	
1	0	0		0	0	2	1	
PRERE	QUISITE		Basic Statistics		•			
On succ	essful com	pletion of	this course, the students will be able to:					
		CO	URSE OUTCOMES	DOMA	[N	LEVI	EL	
CO 1	Constru	ct the freq	uency distributions for the given data sets.	Cognitiv	/e	Applying		
CO 2	-	t and drav	v pie, bar, line, histogram and scatter diagrams ets.	Cognitiv	/e	Evaluating		
CO 3	•		ficient of correlation using Karl Pearson's nan's Method.	Cognitiv	Apply	ing		
CO 4			tence of a relationship between two or more ear regression.	Cognitiv	/e	Analyz	Analyzing	
CO 5		ethe inter- of curve fi	relation between two or more phenomena with tting.	Cognitiv	/e	Evalua	ting	
List of H	Experimen	ts			•			

1. Formation of discrete and continuous frequency distributions-descriptive statistics.

2. Diagrams: Pie, bar, line and scatter diagrams, Graphs: Histogram and normal probability plot.

3. Correlation coefficient, rank correlation, partial and multiple correlations.

4. Regression: Simple and multiple linear regression.

5. Curve estimation.

				CO	s VS PO	Os						
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	
CO 1	3	3	2	0	1	3	3	3	3	3	0	
CO 2	3	3	3	2	3	3	3	3	3	3	2	
CO 3	3	3	2	0	1	3	3	3	3	3	0	
CO 4	3	3	3	1	2	3	3	3	3	3	1	
CO 5	3	3	3	2	3	3	3	3	3	3	2	
TOTAL	15	15	13	5	9	15	15	15	15	15	5	
SCALED VALUE	3	3	3	1	2	3	3	3	3	3	1	
0 - No Relation, 1 -	Low Re	0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation										

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$

200	JRSE NA	ME	Quantita	ative Apt	itude - II	L	Т	Р	C
COU	URSE CO	DE		XMT307	1	1	1	0	2
С	Р	Α				L	Р	Н	
2	0	0				1	1	0	2
PREREC	QUISITE		Number systems as	nd algebr	a				
On succe	ssful com	pletion of	f this course, the stu	idents wi	ll be able to:				
		CO	URSE OUTCOME	S		DOMA	N	LEV	EL
CO 1			oncepts of profit and	loss, rati	o & proportion to	Cognitiv	/e	Apply	ing
CO 2	solve the Apply th problems	e basic c	oncepts of partnersh	ip, chain	rule to solve the	Cognitiv	ve 🛛	Apply	ing
CO 3	1	e basic o	concepts of time &	work, p	pes &cisterns to	Cognitiv	/e	Apply	ing
CO 4		e basic c	concepts of time &	distance	and problems on	Cognitiv	ve 🛛	Apply	ing
CO 5			oncepts of boats and e problems.	streams	and allegation or	Cognitiv	/e	Apply	ing
UNIT 1			r						3+3
	Loss, Rat	tio and Pr	oportion.						<u></u>
UNIT 2 Partnershi	ip, Chain I	Rule							3+3
UNIT 3	ip, enum i								3+3
	work, Pip	es and Ci	sterns.						
UNIT 4	1 D' - 4	Duchler							3+3
UNIT 5	a Distance	, Problem	ns on Trains.						3+3
	Streams a	nd allega	tion or mixture.						5+5
	TURE	15	TUTORIAL	15	PRACTICAL	0	TOTA	AL	30
Text Boo	k								
3. R.S.	Aggarwal	Quantita	tive Aptitude for Cor	mpetitive	Examinations SC	hand: 20 th	edition	$\frac{1}{(2013)}$	
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4. Banki	ng awarer	ness by S	angram Keshari Rou	it and So	umya Ranjan Behe	era, B.K. F	ublicat	ions Pv	t. Ltd.;
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				CO	s VS PO	Os					
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 1	3	3	2	0	1	3	3	3	3	3	0
CO 2	3	3	2	0	1	3	3	3	3	3	0
CO 3	3	3	2	0	1	3	3	3	3	3	0
CO 4	3	3	2	0	1	3	3	3	3	3	0
CO 5	3	3	2	0	1	3	3	3	3	3	0
TOTAL	15	15	10	0	5	15	15	15	15	15	0
SCALED VALUE	3	3	2	0	1	3	3	3	3	3	0
0 - No Relation, 1 -	Low Re	lation, 2	2- Medi	ium Re	lation, 3	3- High	Relatio)n	1		<u>I</u>

Co	ourse	Name	DISAS	ΓERMA	NAGEMENT	1	L	Т	Р	C
Co	ourse	Code		XUM	1003		1	0	0	1
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Prere	equisi	te	Basic knowledge	about e	nvironment.					
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		_	Course Outco	omes		ĺ	Dom	ain	Lev	el
CO1			n din gtheconcepts rpreparedness	ofapplic	ationoftypes		Cogni	tive	Apply	
CO2			ndconditions&Dis	cussthef	ailuresduetodis	aster.	Cogni	tive	Analyze	•
CO3		Understa occurring	nding of importa globally	nce of se	eismic waves		Cogni	tive	Analyze	e
CO4			Disasterandmitigat	ionprob	lems.		Cogni	tive	Apply	
CO5		Keen kno v	wledgeone essenti	als ofris	kreduction		Cogni	tive	Apply	
UNI	Γ1	INTROD	UCTION						3	
Princ UNI	Γ2	risk partn APPLICA REDUCT	ATIONOFTECH	NOLO	GY INDISAST	ERRISI	K		3	
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CO 1	3	3	3	2	3	1	1	1	1
CO 2	3	3	3	3	3	1	2	1	1
CO 3	3	3	3	3	3	1	2	1	1
CO 4	3	3	3	2	3	1	1	1	1
CO 5	3	3	3	2	3	1	1	1	1
TOTAL	15	15	15	12	15	5	7	5	5
SCALED	3	3	3	3	3	1	2	1	1
VALUE					č	-	-		•
0 - No Relation,	1 – Low R	elation	, 2- Med	ium Rel	ation, 3	3- High F	Relation	, ,	
$1-5 \rightarrow 1, 6-10 \rightarrow 1$	$2, 11-15 \rightarrow$	3							

SEMESTER IV பொதுத்தமிழ் - 4

பாடக்கு			L	Т	Р	SS	H	C
றியீடு/ Course Code	பாடப்பெயர்/ Course Name	Category						
XGT401	பொதுத்தமி ழ் - 4	Supportive	3	0	0	0	3	3
Pre-	<i>ு</i> பன்னிரெண்டா	ாம்வகுப்பில்தப	ிமை		டமாக	ப்பயி	ំ ហិ(ក្រ	க்க
requisite	வேண்டும்.	C <i>F</i>		Ū			- 0	
பாடப்ப	<u> </u>		•	•				
யன்கள்	இப்பாடத்தைக்	கற்பதால்பின்	வருமா	பயனக	ளைப	பாணவ	ர்கள்	୬
/ Course outcomes	டைவர்.							
	சங்கஇலக்கிய	த்தில்காணப்பெ	பறும்வ	பாழ்வி	யல்ச்	-	<u>ிந்த</u> ு	கொ
CO1	தனைகளைஅ	றிந்துகொள்வர்					ளல்	
	<u></u>						ndersta	
CO2	தமிழின்தொன் தொல்கு கால்	-	ிர் ட ு	᠂᠇᠇᠅᠇᠉	мπο		ரிந்து எல்	וסוו
002	செம்மொழித்த	ക്രഉ്താനന്നന്നത്	ற்றவு	காளஞ	ந்தல		ndersta	nd)
	நாடகஇலக்கிய	பம்மூலம்நடிப்	பாற்றஎ	லையுட	Ď,		தரிந்த	
CO3	ு				,		 காள்எ	
	படைப்பாற்றன		5ல்.			(A	pply)	
	தமிழிலிருந்து.	அலுவலகக்கடி	தங்கல	ளமெ	ாழிெ	பெ	தரிந்த	j
CO4	யர்ப்பதால்ஆர்	 பகிலஅறிவைட்	பெறுத	தல்.	•	ଭ	காள்எ	ால்
							pply)	
	மொழியறிவே	ாடுவேலைவா	ய்ப்பில	லைப்	பறுத		குப்பா	-
CO5							சய்த	່ນ
	K1- Remember; K2) _ Understand: K2	_4 pplu	· KA An			nalyze	
	Evaluate; K6 – Cre		-дрргу	, K4 Alla	агу <i>z</i> е, г	N		
அலகு - I		எட்டுத்தொ	ወይ			910	ணிச	ள்
	நற்றிணை	(10,14,16)		கறுந்	தொல	እቆ		

	(16,17,19,20,25,29,38,440), கலித்தொகை(38,51),	
	(10,17,19,20,25,29,30,440), பென்னு வின்னு வின்னு (36,51), அகநானூறு (15,33,55), புறநானூறு (37,88,112),	
	பரிபாடல் (55)	
໑ເວນເຮ	பரபாடல்	9மணிகள்
அலகு - II	பத்திப்பட்டு	900010001
	நெடுநல்வாடை – நக்கீரர்.	
அலகு - III	நாடகம்	9மணிகள்
	கலகக்காரர்தோழர்பெரியார் – மு.ராமசாமி.	
அலகு - IV	பாடம்தழுவியஇலக்கியவரலாறு	9மணிகள்
அலகு - V	மொழித்திறன்	9மணிகள்
	1. மொழிபெயர்ப்பு / கலைச்சொற்கள்	
	2. ஆங்கிலப்பகுதியைத்தமிழில்மொழிபெயர்த்தல்.	
	3. அலுவலகக்கடிதம் – தமிழில்மொழிபெயர்த்தல்.	
	Total Lecture Hours	45மணிகள்
பாடநூ	ល់់តពាំ	
1.	எட்டுத்தொகை, எம்.நாராயணவேலுப்பிள்ளை, நர்மத சென்னை.	தாபதிப்பகம்,
2.	பத்துப்பாட்டுமூலமும்நச்சினார்க்கினியர்உரையும், டாக்டர்.உ.வே.சாமிநாதையர், டாக்டர்.உ.வே.சாமிநாதையர்நூல்நிலையம், சென்ன	റன.
3.	கலகக்காரர்தோழர்பெரியார் – மு.ராமசாமி (நாடகநு	
பார்வை		
1.	தமிழ்இலக்கியவரலாறு –	
	சிற்பிபாலசுப்பிரமணியன்.	
2.	புதியநோக்கில்தமிழ்இலக்கியவரலாறு -	
	தமிழண்ணல்	
3.	வகைமைநோக்கில்தமிழ்இலக்கியவரலாறு –	
	எஃப்.பாக்கியமேரி.	1

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

Web Sources

- Tamil Heritage Foundation www.tamilheritage.org<http://www.tamilheritage.org>
- Tamil virtual University Library www.tamilvu.org/library http://www.virtualvu.org/library
- Project Madurai www.projectmadurai.org.
- Chennai Library www.chennailibrary.com<http://www.chennailibrary.com>.
- Tamil Universal Digital Library-www.ulib.prg<http://www.ulib.prg>.
- Tamil E-Books Downloads tamilebooksdownloads.blogspot.com
- Tamil Books online books.tamilcube.com
- Catalogue of the Tamil books in the Library of British Congress archive.org
- Tamil novels online books.tamilcube.com

Strong-3, Medium-2, Low-1

COUR	SE CODE	XGE402	L	Т	P	SS	Η	C
COUR	SE NAME	ENGLISH IV	2	1	0	0	3	3
C:P:A-	3:0:0							
COUR	SE OUTCOM	IES:	D	oma	in	Ι	Level	
		of course, the learners will be able to get						
.	ehensive skills							
CO1		nmunicate effectively and appropriately	Co	gniti	ve	Un	derst	and
000	in real life si			• , •			. 1	
CO2	<i>Use</i> English curriculum	a effectively for study purpose across the	Co	gniti	ve	F	Apply	/
CO3		rest in and appreciation of Literature	Co	gniti	VO	Und	lersta	nd
				0				
CO4	<i>Develop</i> and skills	integrate the use of the four language	Co	gniti	ve	Un	dersta	and
CO5		ir language skills especially in the areas of	Co	gniti	VO	Un	derst	and
005		l pronunciation.		ginu	ve	Ull	Jeista	anu
SYLLA	-						HO	URS
UNIT-	LIFE W	RITING				6	+3+0	=9
111		alala Yousafzai - Chapter 1						
		- Nikola Tesla - Chapter 2						
UNIT-						6	+3+0	=9
2.1	The Zoo Story	- Edward Albee						
		Anton Chekhov						
UNIT-						6	+3+0	=9
Intervie	ws							
		a's Interview with Larry King.						
3.2 I	Rakesh Sharma	a's Interview with Indira Gandhi						
	from Space							
		vith Sid Lowe (Print)						
UNIT-	IV LANGU	AGE COMPETENCY				6	+3+0)=9
		ng & Debating						
		tions & Responding to Suggestions, Asking for and	d Giv	ing A	Advic	e		
		to face, telephone and video conferencing)					()	<u> </u>
		H FOR WORKPLACE					6+3+	v=9
	11	ns: Covering letters, CV and Resume						
	0 0	tal profile - LinkedIn		ion		π		
	Credit/debit ca	Online & Manual): creation of account, railway res	servai	1011,	AIN	1,		
		-Practical Skills for Interviews.						
5.1 L		$\frac{1}{L=30 / T=15}$	Г	otal	Hou	Irs	45	5
Futorial	Activities							
		derstanding incomplete texts						
		ece of prose or poetry						
	Communication							
12) R	Role play							

Text books:

- Borg, Taylor & Francis, *Writing Your Life: A Guide to Writing Autobiographies*, Mary 2021
- Colin Dolley, Rex Walfor. The One-Act Play Companion: A Guide to plays, playwrights, 2015
- Jeanne Kelly.*How to Build a Professional Digital Profile* Kindle Edition by Bernish, Bernish Communications Associates, LLC; 1st edition, 2012
- Tesla, Nikola.My Inventions by Ingram Short title, 2011
- Yousafzai, Malala. I Am Malala The Girl Who Stood Up for Education and Was Shot by the Taliban, Christina Lamb, Little Brown, 2013

E-Resources:

- For Readers'Theatre: https://www.youtube.com/watch?v=JaLQJt8orSw&t=469s(the link to the performance; refer scripts by Aaron Sheperd)
- http://BBC learn English.com
- Nelson Mandela with Larry King
- Interviews: http://edition.cnn.com/TRANSCRIPTS/0005/16/lkl.00.html

CODE A 0		Programming with	C++	L	Т	Р	C
0		XMT403		3	1	0	4
_				L	Т	Р	H
				3	1	0	4
E	C programme						
mpletion	of this course, the stu	dents will be able to:	:				
C	COURSE OUTCOMES	5	D	OMA	IN	LEV	EL
basic cond	ncepts on object-oriente	d programming.	C	ogniti	ve 1	Understa	anding
• -	es of inheritances and A eal time problem.	pplying various levels	s of C	ogniti	ve	Understa	anding
	rator Overloading funct	ion.	С	ogniti	ve 1	Understa	anding
istrate the	e concept of Polymorph	nism.	C	ogniti	ve 1	Understa	anding
nthe file co	concept and exception h	andlings in C++	С	ogniti	ve 1	Understa	anding
SES AND s – Definin - Overload ATOR OV ry, binary o Single, N ct Classes. FERS ANI inter to Cla array of cla d Virtual I	D POLYMORPHISM ass, Object – this pointe lasses – Memory mode Functions.	 Static Member varia classes – Constructor INHERITANCE ng Friend functions – lierarchal, Hybrid, M I er – Pointers to derive ls – new and delete op 	bles and f or and des type conv fulti path d classes a perators –	unctio tructor inher and Ba dynam	ns – arn with s n – Inho itance ase clas nic obje	9 - ray of ol tatic me 9 - eritance: - Virtu 9 - ses - Ar ct - Bin 9 -	+ 3 pjects mbers + 3 : Type al bas + 3 rays - ding, + 3
n – Templa	nodes – Sequential Real lates – Exception Han						
	aneous functions. IS TUTORIAL	15 PRACTIO		0	ТОТ	AL.	60
				~			
– Miscella 4			nd TURBO) C &	C++",	Pearson	
<u>– Mi</u>			ne, "Object-Oriented Programming With ANSI ar			ne, "Object-Oriented Programming With ANSI and TURBO C & C++", I tion. 2003.	he, "Object-Oriented Programming With ANSI and TURBO C & C++", Pearson tion. 2003.

Private Limited, 2011, fifth edition.

E-References:

https://nptel.ac.in

	COs VS POs											
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	
CO 1	3	2	1	0	0	2	2	2	3	2	0	
CO 2	3	2	1	0	0	2	2	2	3	2	0	
CO 3	3	2	1	0	0	2	2	2	3	2	0	
CO 4	3	2	1	0	0	2	2	2	3	2	0	
CO 5	3	2	1	0	0	2	2	2	3	2	0	
TOTAL	15	10	5	0	0	10	10	10	15	10	0	
SCALED VALUE	3	2	1	0	0	2	2	2	3	2	0	
0 - No Relation, 1 -	Low Re	lation, 2	2- Medi	ium Re	lation,	3- High	Relatio	on		1	•	

 $1 ext{-}5 ext{-}1, 6 ext{-}10 ext{-}2, 11 ext{-}15 ext{-}3$

	URSE NAI	ME	Fourier Se	ries and T	Transforms	L]		Р	С
CO	URSE CO	DE		XMT404		3	1		0	4
С	Р	Α				L	J		Р	Н
4	0	0				3	1		0	4
PREREC	QUISITE		Algebra, Trigonon	netry, Diff	erential and Integr	al calculu	s			
On succe	essful comp	oletion of	this course, the stu	ıdents wil	l be able to:					
		COU	URSE OUTCOME	S		DOMA	IN	L	EVI	EL
CO 1	•		even functions and given functions.	l determir	e Fourier series	Cogniti	ve	А	pplyi	ng
CO 2	Determin	e Half- ra	nge Fourier sine an	d cosine e	xpansions.	Cogniti	ve	Und	ersta	nding
CO 3	Demonst	rate the p	roperties of Fourier	Transform	1.	Cogniti	ve	Und	ersta	nding
CO 4	Solve the	linear dif	ferential equations u	ising Lapl	ace transform.	Cogniti	ve	Α	pplyi	ng
CO 5	Apply Z-t	transform	s to solve the different	ence equat	ions.	Cogniti	ve	A	pplyi	ng
UNIT 1	Fourier s	eries							9+	3
Root mea UNIT 3 Fourier 1 Transforr Linearity Convolut UNIT 4 Laplace t periodic theorem - UNIT 5 Z-transfor theorems	In square va Fourier 1 Integral Th Integral Th Integr	alue - Pars Transform teorem (s Cosine & Change of m (statem Transform - Transfor Transfor ons of Lap orms entary propon on of diffe	statement only), For & Sine Transforms of scale, Modulation ent only), Inverse on ms of Elementary m of Derivatives - polace Transforms for perties – Inverse Z - rence equations – S	armonic a ourier Tra of elemer n. Examp f Fourier ' functions Transform r solving s - transform	nalysis. Insform of a furnatary functions - F les Fourier Trans Transform, Examp – Properties of La n of integrals- In second order differ n – Convolution the difference equation	action, Fo Properties form of L les. aplace tran verse tran rential equ neorem – I ons. using	urier of Fo Deriva nsforn ation nitial Z-tra	Cosin purier atives. n - Tr as - C s. and F nsform	9 + ne & Tran Exa: 9 + ansfo Convo 9 + inal n.	3 sform mples 3 orm colutio 3 value
	ΓURE	45	TUTORIAL	15	PRACTICAL	0	ТО	TAL		60
Text Boo	K				Edition, Khanna F					

Pvt. Ltd., New Delhi, 2012.

- 2. Robert T. Seeley. Fourier Series and Integrals, Dover Publications, New York, 2006.
- 3. Ray Hanna, J. Fourier Series, Transforms and Boundary Value Problems, Dover Publications, New York, 2008.
- 4. Churchill, R.V. and Brown, J.W., "Fourier Series and Boundary Value Problems", Fourth Edition, McGraw Hill Book Co., Singapore (1987).

E-References:

https://nptel.ac.in

COs VS POs											
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 1	3	3	2	0	1	3	3	3	3	3	0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	2	1	0	0	2	2	2	3	2	0
CO 4	3	3	2	0	1	3	3	3	3	3	0
CO 5	3	3	2	0	1	3	3	3	3	3	0
TOTAL	15	13	8	0	3	13	13	13	15	13	0
SCALED VALUE	3	3	2	0	1	3	3	3	3	3	0
0 - No Relation, 1 -	Low Re	lation, 2	2- Medi	ium Re	lation, 2	3- High	Relatio)n	1	1	1

 $1 ext{-} 5 ext{-} 1, 6 ext{-} 10 ext{-} 2, 11 ext{-} 15 ext{-} 3$

CO	URSE NA	ME		Statistics for	or Data	Science - II	L	T		P	С
CO	URSE CC	DDE		2	XMT40	5	2	1		0	3
С	P	Α					L	Т		Р	Н
2	0	0					2	1		0	3
PRERE	QUISITE		Basi	ic Statistics							
On succ	essful com	pletion of	f this	course, the stu	dents w	ill be able to:					
		CO	URSI	E OUTCOMES	5		DOMA	IN	L	EVI	EL
CO 1	Demonst	trate the b	basics	of R.			Cogniti	ve	Und	ersta	nding
CO 2	Explain	the basic	conce	pts of probabili	ty.		Cogniti	ve	Und	ersta	nding
CO 3	Illustrat	e the disci	rete ar	d continuous ra	andom v	ariable.	Cogniti	ve	Und	ersta	nding
CO 4	Demons distributi		conce	ots of discrete a	and cont	inuous probability	Cogniti	ve	Und	ersta	nding
CO 5	Construe data sets.		istical	inference of S	tudent T	test for the given	Cogniti	ve	А	pplyi	ing
UNIT 1	R									6+	3
				res in R- Data v	visualiza	tion with R-Data a	analysis wi	th R.		-	•
	Probabi			E (1 1 114	A 11		6 +	
				ace – Events – Theorem -Appli		tic Definition of P	robability -	- Add	lition	Inec	orem –
	Distribu		-	neorem -repn	cations.					6+	3
				Variables – I	Distribut	ion Function of a	Random V	Variat	ole –		
						acteristic Functions					
	Probabi	-								6+	
Function	s – Discre	te Probab	ility I			oment Generating F I Distribution – Po					
UNIT 5		ial statisti		Districtution.						6+	3
		Central lir	nit th	eorem - Confi	dence ir	nterval- T-test- Ty	pe I and I	II erro	ors- S	tude	nt's T
distributi	on. TURE	30		TUTORIAL	15	PRACTICAL	0	TO	ГАТ		45
				IUIUKIAL	15	FRACTICAL	U	10	IAL		43
Text Bo		(()) 0				1.2.1.2.4.1			0.4.4		
1. Jared	P Lander,	"R for ev	eryon	e: Advanced A	nalytics	and Graphics", Ad	dition Wes	ley, 2	014.		
-	a, S.C. and i, 11th Ed,	- ·	V.K.:	"Fundamentals	s of Mat	hematical Statistics	", Sultan &	& Cha	nd &	Sons	, New
Referen	ces										
1. Hasti	e, Trevor,	et al. "The	e elem	ents of Statistic	cal Leari	ning", Springer, 20	09.				
2. Peter 2020		ndrew Bru	ice and	d Peter Gedeck	, "Practi	cal Statistics for Da	ata Scientis	sts", 2	nd Ec	litior	n, May
	•										

3. Pratap Dangeti, "Statistics for Machine Learning", July 2017.

E-References

https://nptel.ac.in

COs VS POs											
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	2	1	0	0	2	2	2	3	2	0
CO 4	3	2	1	0	0	2	2	2	3	2	0
CO 5	3	3	2	0	1	3	3	3	3	3	0
TOTAL	15	11	6	0	1	11	11	11	15	11	0
SCALED VALUE	3	3	2	0	1	3	3	3	3	3	0

1 cdot 5 cdot 1, 6 cdot 10 cdot 2, 11 cdot 15 cdot 3

Statistics for Data Science Lab II using R Programming						
Г406	0	0	2	1		
	L	Т	Р	H		
	0	0 0				
s will be able to:						
	DOMAI	N	LEVI	EL		
the given data sets.	Cognitive		Apply	ing		
or the given data sets.	Cognitiv	ive Applying		ing		
are test.	Cognitiv	ve 🛛	Analyz	ving		
ts by using One-way	Cognitiv	ve	Analyz	ving		
or a given data set.	Cognitiv	ve	Apply	ing		
d paired t-test.						
	d paired t-test.	d paired t-test.	d paired t-test.	d paired t-test.		

5. Binomial test, run test, and sign test.

COs VS POs													
PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2			
3	2	1	0	0	2	2	2	3	2	0			
3	2	1	0	0	2	2	2	3	2	0			
3	3	3	1	2	3	3	3	3	3	1			
3	3	3	1	2	3	3	3	3	3	1			
3	2	1	0	0	2	2	2	3	2	0			
15	12	8	2	4	12	12	12	15	12	2			
3	3	2	1	1	3	3	3	3	3	1			
	3 3 3 3 3 15	3 2 3 2 3 3 3 3 3 2 15 12	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	PO 1PO2PO3PO432103210333133313210151282	PO 1PO2PO3PO4PO532100321003331233312321001512824	PO 1PO2PO3PO4PO5PO6321002321002333123333123321002151282412	PO 1PO2PO3PO4PO5PO6PO73210022321002233312333331233321002215128241212	PO 1PO2PO3PO4PO5PO6PO7PO832100222321002223331233333312333321002221512824121212	PO 1PO2PO3PO4PO5PO6PO7PO8PO9321002223321002223333123333333123333321002223321002233151282412121215	PO 1PO2PO3PO4PO5PO6PO7PO8PO9PS013210022232321002223233312333333331233333321002223215128241212121512			

0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation

1 cdot 5 cdot 1, 6 cdot 10 cdot 2, 11 cdot 15 cdot 3

	DURSE NAI	ME	Vedic	Mathematics I	L	Т	Р	С
CC	DURSE CO	DE		XMT407	1	1	0	2
С	Р	Α			L	Т	Р	Η
2	0	0			1	1	0	2
PRERE	QUISITE		Number Systems a	nd Algebra				
On suce	cessful comp	pletion of	this course, the stu	idents will be able to:				
		COL	JRSE OUTCOME	S	DOMAI	N	LEV	EL
CO 1	Explain t	he history	of Vedic mathemat	ics	Cognitiv	e U	ndersta	nding
CO 2	Explain	the conc	ept of multiplication	tion and division using	Cognitiv	e U	ndersta	nding
			le and from left to r			TI	ndorato	ndina
CO 3				s ending in 5 and squaring age to simplify algebraic	Cognitiv	e U	ndersta	nding
	squaring.							
CO 4				ze and apply division by 9 y using straight division.	Cognitiv	e	Apply	ing
CO 5				lations of HCF and LCM	Cognitiv	e U	ndersta	nding
005		d and accu			Cognitiv	C		U
UNIT 1	Addition	s and Sub	tractions					3+3
History	of Vedic Ma	athematics	; Various technique	es to carry out basic operation	ns covering	g Additi	on - A	dditior
by Left	to Right - D	D ropping t	ens and grouping to	echniques; Various techniqu	les to carry	out ba	sic ope	
	~ ~ .						1	rations
covering	g Subtraction	n -Starting	g complements from	m the middle of the sum -				
	g Subtraction of the sum -			m the middle of the sum -				
middle of		General ca	ase.	m the middle of the sum -			ents fro	
middle of UNIT 2	of the sum - Multiplic	General ca ation and	ase. Division	m the middle of the sum -	leaving co	omplem	ents fro	$\frac{3+3}{3+3}$
middle d UNIT 2 Multipli digital r	of the sum - Multiplic cation by spoots; Division	General ca ation and pecific nut on (Divisi	ase. Division mbers – Multiplica on of Double-Digit		leaving co - Verifyin	omplem g answ	ents fro	3+3 use of
middle o UNIT 2 Multipli digital r numbers	of the sum - Multiplic cation by sp oots; Divisions s near base -	General ca ation and pecific nu on (Divisi Comparis	ase. Division mbers – Multiplica on of Double-Digit on of fractions.	tion by numbers near base	leaving co - Verifyin	omplem g answ	ents fro ers by - Divis	3+3 use of sion of
middle o UNIT 2 Multipli digital r numbers UNIT 3	Multiplic Multiplic acation by sp oots; Divisions near base - Square and	General ca ation and pecific nu on (Divisi Comparis nd Square	ase. Division mbers – Multiplica on of Double-Digit on of fractions. Roots	tion by numbers near base Numbers) - Digital Roots	leaving co - Verifyin - Divisibili	g answ ty tests	ents fro ers by - Divis	3+3 use of sion of 3+3
middle o UNIT 2 Multipli digital r numbers UNIT 3 Introduc	Multiplic A Multiplic A Multiplic A cation by sp oots; Divisions A near base - A Square and Ction of square	General ca ation and pecific nur on (Divisi Comparis nd Squar res of nur	ase. Division mbers – Multiplica on of Double-Digit on of fractions. e Roots nbers - Difference of	tion by numbers near base Numbers) - Digital Roots of two Square numbers - Fin	leaving co - Verifyin - Divisibili	g answ ty tests es of nu	ents fro ers by - Divis mbers	$\frac{3+3}{4}$ use of sion of $\frac{3+3}{6}$
middle of UNIT 2 Multipli digital r numbers UNIT 3 Introduct with 5 -	bef the sum - Multiplic acation by spectrum s near base - Square and ction of square Different m	General ca ation and pecific nur on (Divisi Comparis nd Square res of num ethods of 2	ase. Division mbers – Multiplica on of Double-Digit on of fractions. e Roots mbers - Difference of Squares (General m	tion by numbers near base Numbers) - Digital Roots	leaving co - Verifyin - Divisibili	g answ ty tests es of nu	ents fro ers by - Divis mbers Roots.	$\frac{3+3}{3+3}$ $\frac{3+3}{3+3}$ ending
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middle of UNIT 2 Multipli digital r numbers UNIT 3 Introduct with 5 - UNIT 4 Cubes - UNIT 5	Multiplic Aution by spoots; Divisions and base - Square and Cube roots LCM and	General ca ation and pecific nu- on (Divisi Comparis nd Square res of nun ethods of a I Cube Ro I HCF	ase. Division mbers – Multiplica on of Double-Digit on of fractions. e Roots mbers - Difference of Squares (General mosts) ots of Exact Cubes	tion by numbers near base Numbers) - Digital Roots of two Square numbers - Fin ethod, Base method, Dupley - General division.	leaving co - Verifyin - Divisibili ding square (method) -	g answ ty tests es of nu	ents fro ers by - Divis mbers Roots.	$\frac{3+3}{3+3}$ use of sion of $3+3$ ending
middle of UNIT 2 Multipli digital r numbers UNIT 3 Introduct with 5 - UNIT 4 Cubes - UNIT 5 Factoriss	Multiplic Multiplic acation by sp oots; Divisions near base - Square and Cition of squar Different m Cube roots LCM and ation Methoo	General ca ation and becific number on (Divisi Comparis nd Square res of nume thods of a I Cube Ro I Cube Ro I HCF d of LCM	ase. Division mbers – Multiplica on of Double-Digit on of fractions. e Roots nbers - Difference of Squares (General moots) ots of Exact Cubes and HCF - HCF and	tion by numbers near base Numbers) - Digital Roots of two Square numbers - Fin ethod, Base method, Duples - General division. d LCM of Arithmetic and A	leaving co - Verifyin - Divisibili ding square (method) -	g answ ty tests es of nu Square	ents fro ers by - Divis mbers Roots.	3+3 use of sion of 3+3 ending 3+3 3+3
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E-References

http://www.funwithfigures.com/

http://www.youtube.com/watch?v=b3PFjsUgULM&feature=youtu.be

				CO	s VS PO	Os					
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	2	1	0	0	2	2	2	3	2	0
CO 4	3	3	2	0	1	3	3	3	3	3	0
CO 5	3	2	1	0	0	2	2	2	3	2	0
TOTAL	15	11	6	0	1	11	11	11	15	11	0
SCALED VALUE	3	3	2	0	1	3	3	3	3	3	0
0 - No Relation, 1 -	Low Re	lation, 2	2- Medi	ium Re	lation, 3	3- High	Relatio	n	<u> </u>	1	1

Co	ourse N	Name	Introduction to Entrepreneurship	L	Т	P	C	
			Development					
Co	ourse (Code	XUM004	1	0	0	1	
С	Р	Α		L	Т	SS	Н	
1	0	0		1	0	1	1	
	requis		Basic skills like critical thinking, creativity, networking, leadership.		king, prob	lem-solving	· · · · · · · · · · · · · · · · · · ·	
On	succes	sful co	mpletion of this course, the students will be a	able to:				
			Course Outcomes	Do	main	Level		
CO1Understand the concept of EntrepreneurshipCO2Understand about an Entrepreneur					gnitive	Understa	Inding	
CO	2	gnitive	Understa	inding				
CO	3	Unde	rstand the characteristics of Entrepreneur	Cog	gnitive	Understa	nding	
CO	4	Unde	rstand the ways to acquire skills of	Cog	gnitive	Understandin		
		-	oreneur					
CO	5	Unde	rstand the concept of Intrepreneurship	Cog	gnitive	Understa	Inding	
UN	IT 1	INTR	ODUCTION TO ENTREPRENEURSHIP	P		3+3	3	
Ent	repren	eurship	icept of Entrepreneurship, History of Entrepr in Economic Development, Myths about Ent Management and Future of Entrepreneurship	treprene	*	÷	e of	
	IT 2		C ENTREPRENEUR	r		3+3	3	
Des	ign Th	inking,	Entrepreneur, Skills/ Traits required for being Entrepreneurial Decision Process, Skill Gap em, Entrepreneurial Success Stories.		-			
	IT 3	CHA	RACTERISTICS OF AN ENTREPRENE	EUR		3+	3	
UN					5100	1 /		
Intr an H Rela bety Ente	oductio Entrepr ationsh ween a erprise	reneur a nip betv Scienti - Diffe	aracteristic Features of Successful Indian Ent and a Manager - Difference between an Entre veen the terms Entrepreneur, Entrepreneurial st, Inventor and Entrepreneur - Relationship rence between Entrepreneur and Enterprise - and Entrepreneur - Common Myths on Entre	epreneur and En between Differe	and an In trepreneur n Entrepre ence betwe	trapreneur - ship - Diffe neur and		

	Skills – Cr		nancial	Skills –	- Leade	rship Sk	kills – Tii	ne Mana	gement and
– Customer S	Service Sk	ills – Fiı				r			
Organization	al Skills –	Technic	cal Skill	ls					
UNIT 5 IN	NTRAPR	ENEUR	SHIP						3 + 3
What is Intra	preneurshi	ip – Und	lerstand	ling Int	raprene	urship -	- Types o	f Intrapre	eneurs –
Characteristic	cs of Intra	preneurs	s – Exar	nples o	f Intapı	eneursh	nip		
Lecture	15	Self - S	Study	15			Total		30
Text Book				1					
1. Jayashree	Suresh. Er	treprene	eurial D	evelop	ment. N	/Jarghan	n Publica	tions.	
-		r		F					
References	F actor			- 11 D	·	A			1
	-	_			iness M	lanagen	nent (6th	Edition)	by Norman M.
Scarborough	(Paperbac	sk - Jan	13, 2010	0)					
2. Entreprene	urship and	d Small	Busines	ss Mana	agemen	t, Stude	nt Editio	n by Gler	ncoe McGraw-Hil
(Hardcover -	1				0	,		<i>J</i> == J	
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3. Vasant De	sai, Dynar	nics of I	Entrepre	eneursh	ip Deve	elopmer	nt, Star Pi	ublication	n, New Delhi.
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SEMESTER V

	URSE NA	ME	Abstract Algebra	L	Т	Р	C
CO	URSE CO	DDE	XMT501	3	1	0	4
С	Р	A		L	Т	Р	Н
4	0	0		3	1	0	4
PRERE	QUISITE	I	Algebra				
On succ	essful com	pletion of	this course, the students will be able to:				
		CO	URSE OUTCOMES	DOMAI	N	LEVI	EL
CO1Explain the basics of subgroup and cyclic subgroups.CognitiveUnderst							
CO 2	-	the signif	icance of the notions of quotient groups and 3.	Cognitiv	ve 1	Understa	nding
CO 3			fundamental concepts in ring theory such as of rings, integral domains, and fields.	Cognitiv	'e	Understa	nding
CO 4			concepts of vector spaces, subspaces, bases, r properties with examples.	Cognitiv	'e	Understa	nding
CO 5	Identify transform		igenvalues and eigenvectors of linear	Cognitiv	ve	Apply	ing
UNIT 1						9 +	3
Subgrou	p: Necess	ary and su	fficient condition for a subset to be a subgroup	-Order of	the Gr	oup – O	rder of
an eleme	ent – Centr		oup – Normalizer and Centralizer, Product of t	wo subgroi			HK _
Necessar		ficient con	dition for HK to be of a cyclic group a subgro	oup – Inter	section	n and ur	
Necessar subgroup	DS.		dition for HK to be of a cyclic group a subgro				ion of
Necessar subgroup Cyclic s	os. ubgroups :	: Subgrou	dition for HK to be of a cyclic group a subgroup, generators of a cyclic group – Number of	generators	of a	cyclic g	ion of roup –
Necessar subgroup Cyclic s cosets –	os. ubgroups : left coset	: Subgrou s and righ	dition for HK to be of a cyclic group a subgro	generators	of a	cyclic g	ion of roup –
Necessar subgroup Cyclic s cosets – theorem	os. ubgroups :	: Subgrou s and righ	dition for HK to be of a cyclic group a subgroup, generators of a cyclic group – Number of	generators	of a	cyclic g prem – l	iion of roup – Euler's
Necessar subgroup Cyclic s cosets – theorem UNIT 2	os. ubgroups : left coset – Fermat's	Subgroups and rights theorem.	dition for HK to be of a cyclic group a subgroups, generators of a cyclic group – Number of a cosets – Partitioning of a group by cosets –	generators · Lagrange	of a 's theo	cyclic g prem – 1	iion of roup – Euler's <u>3</u>
Necessar subgroup Cyclic s cosets – theorem UNIT 2 Normal	os. ubgroups left cosett – Fermat's subgroup	Subgroups and rights theorem.	dition for HK to be of a cyclic group a subgroups, generators of a cyclic group – Number of at cosets – Partitioning of a group by cosets –	generators - Lagrange	of a 's theo rphism	cyclic g orem – 1 9 + 1 – Kern	ion of roup – Euler's <u>3</u> el of a
Necessar subgroup Cyclic s cosets – theorem UNIT 2 Normal	os. ubgroups left cosett – Fermat's subgroup	Subgroups and rights theorem.	dition for HK to be of a cyclic group a subgroups, generators of a cyclic group – Number of a cosets – Partitioning of a group by cosets –	generators - Lagrange	of a 's theo rphism	cyclic g orem – 1 9 + 1 – Kern	ion of roup – Euler's <u>3</u> el of a
Necessar subgroup Cyclic s cosets – theorem UNIT 2 Normal homomo groups.	os. ubgroups left cosett – Fermat's subgroup	Subgroups and rights theorem.	dition for HK to be of a cyclic group a subgroups, generators of a cyclic group – Number of at cosets – Partitioning of a group by cosets –	generators - Lagrange	of a 's theo rphism	cyclic g orem – 1 9 + 1 – Kern	ion of roup – Euler's <u>3</u> el of a
Necessar subgroup Cyclic s cosets – theorem UNIT 2 Normal homomo groups. UNIT 3	os. ubgroups: left coset: – Fermat's subgroup rphism – 1	: Subgrou s and righ s theorem. s: Quotien (somorphis	ndition for HK to be of a cyclic group a subgroups, generators of a cyclic group – Number of the the cosets – Partitioning of a group by cosets – the groups – Group Homomorphism – Canonical sm – Automorphism - Inner Automorphism – C	generators - Lagrange l Homomo Cayley's Th	of a 's theo rphism	cyclic g prem – 1 9 + - Kern – Perm 9 +	tion of roup – Euler's $\frac{3}{2}$ el of a utation 3
Necessar subgroup Cyclic s cosets – theorem UNIT 2 Normal homomo groups. UNIT 3 Rings: I	os. ubgroups : – Fermat's subgroup rphism – 1 Definition a	s Subgroups s and right theorem. s: Quotient (somorphis) and examp	dition for HK to be of a cyclic group a subgroups, generators of a cyclic group – Number of the cosets – Partitioning of a group by cosets – nt groups – Group Homomorphism – Canonical sm – Automorphism - Inner Automorphism – C	generators - Lagrange I Homomo Cayley's Th a ring – Int	of a 's theo rphism leorem	cyclic g prem – 1 9 + - Kern – Perm 9 + Domain -	ion of roup – Euler's 3 el of a utation 3 – Field
Necessar subgroup Cyclic s cosets – theorem UNIT 2 Normal homomo groups. UNIT 3 Rings: I – Sub rin	os. ubgroups : left coset: – Fermat's subgroup rphism – 1 Definition a ngs – Sub	: Subgroups s and right s theorem. s: Quotien (somorphis) and examp fields – Id	dition for HK to be of a cyclic group a subgroups, generators of a cyclic group – Number of the cosets – Partitioning of a group by cosets – at groups – Group Homomorphism – Canonical sm – Automorphism - Inner Automorphism – C les – Types of rings – Elementary properties of a leals – Left ideal – Right ideal – Principal ideal	generators - Lagrange I Homomo Cayley's Th a ring – Int a ring – Int	of a 's theo rphism eorem regral I t ring -	cyclic g prem – 1 9 + - Kern – Perm 9 + Domain -	ion of roup – Euler's al of a utation <u>3</u> - Field aal and
Necessar subgroup Cyclic s cosets – theorem UNIT 2 Normal homomo groups. UNIT 3 Rings: I – Sub rin prime Id	os. ubgroups: – Fermat's subgroup rphism – 1 Definition a ngs – Sub leals – Ch	s Subgrou s and right theorem. s: Quotient somorphist and examp fields – Ic aracteristic	dition for HK to be of a cyclic group a subgroups, generators of a cyclic group – Number of the cosets – Partitioning of a group by cosets – the groups – Group Homomorphism – Canonical sm – Automorphism - Inner Automorphism – C les – Types of rings – Elementary properties of leals – Left ideal – Right ideal – Principal ideal c of a ring – PID – UFD – Homomorphisms	generators Lagrange Homomo ayley's Th a ring – Int – quotien – Isomor	of a 's theo rphism leorem legral I t ring - phism	cyclic g prem – 1 – 9 + – Kern – Perm – 9 + Domain - – Maxim – Kerne	ion of roup – Euler's al of a utation <u>3</u> - Field hal and el of a
Necessar subgroup Cyclic s cosets – theorem UNIT 2 Normal homomo groups. UNIT 3 Rings: I – Sub rin prime Id Homomo	os. ubgroups: - Fermat's subgroup rphism – 1 Definition a ngs – Sub leals – Ch orphism –	: Subgroup s and right theorem. s: Quotien (somorphis) and examp fields – Ic aracteristic Fundament	dition for HK to be of a cyclic group a subgroups, generators of a cyclic group – Number of the cosets – Partitioning of a group by cosets – ent groups – Group Homomorphism – Canonical sm – Automorphism - Inner Automorphism – C les – Types of rings – Elementary properties of the leals – Left ideal – Right ideal – Principal ideal c of a ring – PID – UFD – Homomorphisms that theorem of Homomorphism – Field of que	generators Lagrange Homomo Cayley's Th a ring – Int – quotien – Isomor	of a 's theo rphism eorem t ring - phism an Inte	cyclic g prem – 1 – 9 + – Kern – Perm – 9 + Domain - – Maxim – Kerne egral dor	ion of roup – Euler's al of a utation 3 - Field al and el of a nain –
Necessar subgroup Cyclic s cosets – theorem UNIT 2 Normal homomo groups. UNIT 3 Rings: I – Sub rin prime Id Homomo Polynom	os. ubgroups: left coset: – Fermat's subgroup rphism – l Definition a ngs – Sub leals – Ch orphism – ial rings –	: Subgroup s and right s theorem. s: Quotien (somorphis) and examp fields – Ic aracteristic Fundamen - Division	dition for HK to be of a cyclic group a subgroups, generators of a cyclic group – Number of the cosets – Partitioning of a group by cosets – and groups – Group Homomorphism – Canonical sm – Automorphism - Inner Automorphism – Canonical les – Types of rings – Elementary properties of leals – Left ideal – Right ideal – Principal ideal c of a ring – PID – UFD – Homomorphisms ntal theorem of Homomorphism – Field of que algorithm – Polynomial rings over a UFD – G	generators Lagrange Homomo Cayley's Th a ring – Int – quotien – Isomor	of a 's theo rphism eorem t ring - phism an Inte	cyclic g prem – 1 – 9 + – Kern – Perm – 9 + Domain - – Maxim – Kerne egral dor	tion of roup – Euler's 3 el of a utation 3 - Field al and el of a nain –
Necessar subgroup Cyclic s cosets – theorem UNIT 2 Normal homomo groups. UNIT 3 Rings: I – Sub rin prime Id Homomo Polynom	os. ubgroups: left coset: – Fermat's subgroup rphism – l Definition a ngs – Sub leals – Ch orphism – ial rings – nal field –	: Subgroup s and right s theorem. s: Quotien (somorphis) and examp fields – Ic aracteristic Fundamen - Division	dition for HK to be of a cyclic group a subgroups, generators of a cyclic group – Number of the cosets – Partitioning of a group by cosets – ent groups – Group Homomorphism – Canonical sm – Automorphism - Inner Automorphism – C les – Types of rings – Elementary properties of the leals – Left ideal – Right ideal – Principal ideal c of a ring – PID – UFD – Homomorphisms that theorem of Homomorphism – Field of que	generators Lagrange Homomo Cayley's Th a ring – Int – quotien – Isomor	of a 's theo rphism eorem t ring - phism an Inte	cyclic g prem – 1 – 9 + – Kern – Perm – 9 + Domain - – Maxim – Kerne egral dor	tion of roup – Euler's 3 el of a utation 3 - Field al and el of a nain –

Vector Space: Defin	ition an	d Exan	nples –	Subspa	ces – L	inear T	ransform	nation –	Funda	mental The	eorem of
Homomorphism.	т 1	1	D		1		D 1	1	11•7	N	1
Span of a Set: Line transformation.	ear Inde	penden	се – Ва	asis an	d Dime	ension -	- Rank	and Nu	llity –	Matrix an	d Linear
UNIT 5										9	+ 3
Inner Product Space	e: Defini	ition an	d Exam	ples – (Orthogo	nality –	Orthog	onal Co	mplem		
orthogonalization pro				-	-	•	-		-		
Matrices: Elementary								•	-	-	
Cayley Hamilton the and Eigenvectors.	orem – C	Jses of	Cayley	Hammo	on theor	rem – m	iverse ai	ia powe	roran	natrix, Eige	nvalues
LECTURE	45	Т	UTORI	[AL	15	PRAC	CTICAI	0		TOTAL	60
Text Book											
1. Herstein .I.N – To	pics in A	Algebra	, Vikas	Publish	ning hou	ise Pvt.	Ltd., 19	75, New	, Delhi		
References	1	0	,		0		,	,			
1. Arumugam.S and	A. Thar	igapand	liIssac –	· "Mode	ern Alge	ebra". S	citech P	ublicatio	ons (Inc	dia) Pvt.Ltd	
2. Sharma. J.N. and					-						
3. John B. Fraleigh,											
4. Murugan .M , "A	First Co	urse in	Groups	and Ri	ngs", M	luthali P	ublishir	ig House	e, Cher	mai, 2017.	
5. Murugan. M, "A	First C	Course	in Linea	ar Alge	ebra an	d Boole	an Alg	ebra", N	/luthali	Publishing	g House,
Chennai, 2018.											
E-References											
1. <u>https://nptel.a</u>	c.in										
2. <u>https://francise</u>						-					
Catalog/Cours					-Descri	otions/3	<u>00</u>				
 <u>http://catalog.</u> https://www.p 	-	· ·			f_study	/mathen	natics				
5. https://lsa.umi								ses/500-	level-		
math-courses.			•								
					s VS P	Os					-
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO	PSO1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	2	1	0	0	2	2	2	3	2	0
CO 4	3	2	1	0	0	2	2	2	3	2	0
CO 5	3	3	2	0	1	3	3	3	3	3	0
TOTAL	15	11	6	0	1	11	11	11	15	11	0
SCALED VALUE	3	3	2	0	1	3	3	3	3	3	0
0 - No Relation, 1 – 1	Low Rel	ation,	2- Medi	um Re	lation,	3- High	Relatio	n			<u>.</u>

CO	URSE NA	ME	Real Analysis	L	Т	Р	C	
CO	URSE CO	ODE	XMT502	3	1	0	4	
С	P	Α		L	Т	Р	Н	
4	0	0		3	1	0	4	
PRERE	QUISITE	 ,	Number Systems					
On succ	essful con	npletion of	f this course, the students will be able to:					
		CO	URSE OUTCOMES	DOMAI	N	LEV	EL	
CO 1	Summa	rize the dif	ferent properties of the real line R.	Cognitiv	ve I	Understa	nding	
CO 2	monotor		unded, convergent, divergent, Cauchy, and ces, and calculate limit superior, limit inferior ces.	Cognitiv	ve I	Understa	unding	
CO 3	Demons	strate the b	basic definition and topology of metric spaces.	Cognitiv	ve l	Understa	nding	
CO 4	Explain Compac		cepts of Connectedness, Completeness and	Cognitiv	ve I	Understanding		
CO 5	1		consequences of mean value theorems.	Cognitiv	/e I	Understanding		
UNIT 1						9 +	-3	
upper bo of the sup Element	unds, max premum- A s of point	timum eler Absolute v t set Topo	field axioms, the order axioms, the rational n ment, least upper bound (supremum)- The comp alues - The triangle inequality- the Cauchy-Schw logy: Euclidean space -Open sets and closed set rem-Coverings Lindelof covering theorem.	leteness ax varz's inequ	tiom- s uality.	ome pro	opertie	
UNIT 2						9 +		
Monoton sequence Series:	ic sequen , upper an	ces. Cauch d lower lin	ergent, Divergent and oscillating sequences, A ny's first limit Theorem, Cauchy's second limit 7 nit of sequences. term test-Comparison text- Linear Compariso	Theorem, s	ubsequ	ences, (Cauchy	
UNIT 3						9 +	-3	
Metric S Continu	ous funct	tions on r	es - Limit in Metric Spaces- point set topology in netric spaces: Functions continuous at a point Discontinuous function on R ₁					
UNIT 4		and space				9 +	-3	
Connect - Compl	ete metric	-	ess and Compactness: - Connectedness - Bound - Continuous functions on compact metric spa			y bound	led sets	

UNIT 5) +3
Riemann Integral: H				-	-					damental	theorer
of Calculus –Mean v			2								(0)
LECTURE	45	Т	UTORI	AL	15	PRAC	CTICAI	0	1	OTAL	60
Fext Book											
1. Tom M. Apostol 1997.	l - Math	ematica	l Analy	sis, II	Edition	, Naros	a Publis	shing Ho	ouse, N	ew Delhi	(Unit
References											
 Arumugam. S. a Palayamkottai - 6 Goldberg. R. "Me Arumugam and Is Malik S.C and Sa Viswanath Naik, 	527 002, ethods of ssac,"Mo witha Ar	1997. f Real A odern A ora,"M	analysis' nalysis'' athemati	', Oxfo , New cal An	rd and I Publishi alysis",	BH Pub ing Hou 1991, V	olishing se, 2017 Viley Ea	Co., Nev '.	w Delhi	(2000).	-
E-References											
 <u>https://www.goog</u> <u>com/2012/08/met</u> <u>AhUdwjgGHQsa</u> 	thod-of-1	eal-ana	lysis.pdf	E&ved= usg=A	=2ahUK	EwiHw 0V9zo2	4Ozusr-			press.	
	DO 1	DOA	DO1		-	1	DOT	DOO	DO	DCO1	DCC
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO	PSO1	PSC
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	2	1	0	0	2	2	2	3	2	0
CO 4	3	2	1	0	0	2	2	2	3	2	0
CO 5	3	2	1	0	0	2	2	2	3	2	0
	15	10	5	0	0	10	10	10	15	10	0
ГОТАL	1										
	3	2	1	0	0	2	2	2	3	2	0
TOTAL SCALED VALUE 0 - No Relation, 1 –				-					3	2	0
	Low Re			-					3	2	0

COURSE NAME	Number Theory	L	Т	Р	С
COURSE CODE	XMT503	3	1	0	4

С	Р	A				L	Т	P	н
4	0	0				3	1	0	4
PREREC	UISITE		Number Systems						
On succe	essful com	pletion of	f this course, the stu	ıdents wi	ll be able to:				
		CO	URSE OUTCOME	S		DOMAI	N	LEVI	EL
CO 1			understanding of the principles of mathematical mathematical sectors and the principles of mathematical sectors and the principles of the principle sectors and the principle sectors are sectors and the principle sectors are sectors and the principle sectors are sectors			Cognitiv	ve U	Jndersta	nding
CO 2	Solve the algorithm		Diophantine Equa	tion by	using Euclidean	Cognitiv	'e	Apply	ing
CO 3	Demons	trate the f	netic.	Cognitiv	ve U	Jndersta	nding		
CO 4Explain the basic properties of congruence.Cogn								Jndersta	nding
CO 5			esults in theory of n theorem and Wilsor		U	Cognitiv	ve l	Jndersta	nding
UNIT 1							ł	9 +	3
Peano's A UNIT 2	xiom - M	athematic	al Induction - The B	inomial T	heorem - Early Nu	mber Theo	ery.	9+	2
	ty Theory	v in Inter	gers - The Divisio	n Algorit	hm - The g.c.d.	- Euclide	an Alg		
	ine Equati			n rugoin	inin The S.e.u.	Lucildo	un 1112	,01101111	The
UNIT 3								9 +	
Primes and Gull Con		istributior	ns - The fundamenta	d Theorer	n of Arithmetic -	The sieve of	of Erate	osthenes	- The
UNIT 4								9 +	
	ory of Con odulus- Po	-	Basic Properties of G	Congruend	ce - Special Divisil	oility test -	Linear	Congru	ence
UNIT 5	ouulus- Po	wei lesiu						9 +	3
	Theorem -	Fermat's	factorization method	l - The Lit	tle theorem - Wils	on's theore	n.		<u> </u>
	ΓURE	45	TUTORIAL	15	PRACTICAL	0	TOTA		60
Text Boo1. ElemoReference	entary Nu	mber Theo	ory, David M Burton	, McGraw	/ Hill Education, S	eventhediti	on, 20	17.	
 Ivan N Kumar Neville 	ivan and I avelu. S a e Robinns, howdhury	H. Zuckern nd Sushee , Beginnin	tion to Analytic Nur man - An Introductic ela Kumaravelu – El g Number Theory, 2 urseInNumberTheor	on to theor ements of 2nd Ed., N	y of Numbers. Number Theory, N arosa Publishing H	Nagercoil, 2 Iouse Pvt.I	2002. .td.,Del	hi, 2007	7
1. https:/	//lsa.umicł	n.edu/math	n/undergraduates/und	lergraduat	e-math-courses/50	0-level-ma	th-		
*				-					

courses.html

- 2. <u>http://collegecatalog.uchicago.edu/thecollege/mathematics/#courseinventory</u>
- 3. https://www.princeton.edu/academics/area-of-study/mathematics

				CO	s VS P	Os					
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	РО	PSO1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	3	3	2	0	1	3	3	3	3	3	0
CO 3	3	2	1	0	0	2	2	2	3	2	0
CO 4	3	2	1	0	0	2	2	2	3	2	0
CO 5	3	2	1	0	0	2	2	2	3	2	0
TOTAL	15	11	6	0	1	11	11	11	15	11	0
SCALED VALUE	3	3	2	0	1	3	3	3	3	3	0
0 - No Relation, 1 -	Low Re	lation, 2	2- Medi	ium Re	lation,	3- High	Relatio	n		1	1

CO	URSE NAI	ME		Gr	aph Theo	ory	L	Т	Р	C
CO	URSE CO	DE		2	XMT504A	<u> </u>	3	1	0	4
С	P	Α					L	T	Р	Н
4	0	0					3	1	0	4
PRERE	QUISITE		Alge	bra						
On succ	essful comp	oletion of	f this c	course, the stu	dents wil	l be able to:				
		CO	URSE	OUTCOME	S		DOMA	IN	LEV	EL
CO 1	Explain t	he fundar	mental	concepts in gr	raph theor	у.	Cognitiv	ve	Underst	anding
CO 2	Compare	Eulerian	and H	lamiltonian gra	aphs.		Cognitiv	ve	Underst	anding
CO 3	Relate gra	aph with	matrix				Cognitiv	ve	Underst	anding
CO 4	Utilize Eu	ıler formı	ula to c	obtain planar g	graphs.		Cognitiv	ve	Appl	ying
CO 5	Explain a	n algorith	hm for	vertex colour	ing.		Cognitiv	ve	Underst	anding
UNIT 1									9	+3
Matrix re UNIT 4 Planar (of planar UNIT 5 Colourin	Graphs: Pla graphs. graphs.	ns – Vect mar Grap colouring	tor spa bhs – E g – Edg	ces associated Culer formula - ge colouring –	with grap - Platonic An algori	rriage problem – hs – Cycle space - solids – Dual of a thm for vertex col	– cut-set sp a plane gra	pace.	ector pro 9 Characte 9	+3
LEC	TURE	45	,	TUTORIAL	15	PRACTICAL	0	тот	CAL	60
Text Boo 1. Chou 2. "Ani Pvt.L Reference 1. Grap	dum.S.A. – nvitationto td.,Chenna ces	Graphtheo i, 2006. vith Appl	ory", E	Dr.S.Arumuga	m&S.Ram	nillan India Limite achandran,- SCIT	ECHpubli			

E-References

- 1. https://archive.nptel.ac.in/courses/111/106/111106102/
- 2. <u>https://www.youtube.com/watch?v=sWsXBY1908I</u>
- 3. https://www.youtube.com/watch?v=3VeQhNF5-rE

				CO	s VS P	Os					
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	РО	PSO1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	2	1	0	0	2	2	2	3	2	0
CO 4	3	3	2	0	1	3	3	3	3	3	0
CO 5	3	2	1	0	0	2	2	2	3	2	0
TOTAL	15	11	6	0	1	11	11	11	15	11	0
SCALED VALUE	3	3	2	0	1	3	3	3	3	3	0
0 - No Relation, 1 –	Low Re	lation, 2	2- Medi	ium Re	lation,	3- High	Relatio)n		1	1

CO	URSE NA	ME	Mathen	natical Mo	odeling	L	Т	Р	C
CO	URSE CO	DE	2	XMT504B		3	1	0	4
С	Р	Α				L	Т	Р	H
4	0	0				3	1	0	4
PREREC	QUISITE		Differential Calcul	us					
On succe	essful com	pletion of	this course, the stu	dents will	be able to:				
		CO	URSE OUTCOME	S		DOMA	IN	LEV	EL
CO 1	-		hat can be construct order under study	ed by ordin	nary differential	Cogniti	ve	Appl	ying
CO 2	econom	ics and me				Cogniti	ve	Appl	ying
CO 3	order line	ear differe	ical models that can ntial equations			Cogniti	ve	Analy	zing
CO 4		near diffe	erence equation to nics	solve pro	blems in	Cogniti	ve	Appl	ying
CO 5	Identify through g		ons of the given prob	olems that	can be modelled	Cogniti	ve	Appl	ying
UNIT 1		ticalMode	ling			I		9.	+3
Simplesi			hematicalmodeling-	Techniqu	ue of mathema	tical mo	dels -	- Classi	fication
ofmather	natical mo	dels - Cha	racteristics of mathe	matical mo	odels-Mathematic	almodelin	igthrou	ighalgebi	a.
UNIT 2			eling through differe					9.	+3
	1	•	dels - Non-Linear gr		· · · · · · · · · · · · · · · · · · ·	<u> </u>			
UNIT 3			eling, through syster						+3
			lationdynamics – I			epidemic	s thro	ough syst	ems of
			-Mathematical mod	elsMedicii	ne.			0	
UNIT 4			erence equations		dia an tracta di sa			9 -	+3
			deling through diffe antcoefficients.	erence equa	ation – basic theo	ry of finea	r		
UNIT 5			eling through differe	ence equati	ons			0	+3
			ifference equations i			Iathematic	eal mo		-3
	0	0	in populationdynam			lationatio		acting	
LEC	TURE	45	TUTORIAL	15	PRACTICAL	0	TO	ΓAL	60
Text Boo	ok	1	I			1		I	
1. "Mat	hematicalN	/lodelling'	',JNKapur,NewAgel	Internation	alpublishers,Repi	rint 2018.			
Unit I	Chapter: 1	Sect	ions:1.1 – 1.6 (Pages	(1-20)					
	-		ions:2.1–2.4 (Pages)						
	-		53–62&69-72)	,					
	Chapter: 4		ons:4.1–4.3 (Pages76	5 – 93)					
Unit IV	Chapter: 5	Sectio	ns:5.1-5.2 (Pages96	-105)					

Unit V Chapter: 5 Sections: 5.3–5.5 (Pages106 – 121)

References

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- 2. Mathematical Modeling Models, Analysis and Applications, by Sandip Banerjee, CRCPress, Taylor&Francisgroup, 2014
- 3. MathematicalModelingapplicationswithGeogebrabyJonasHall&ThomasLigefjard,John Wiley& Sons, 2017

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- 1. https://www.digimat.in/nptel/courses/video/111107113/L19.html
- 2. <u>https://www.youtube.com/watch?v=AccTsyDtV_8</u>

COs VS POs											
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	РО	PSO1	PSO2
CO 1	3	3	2	0	1	3	3	3	3	3	0
CO 2	3	3	2	0	1	3	3	3	3	3	0
CO 3	3	3	3	1	2	3	3	3	3	3	1
CO 4	3	3	2	0	1	3	3	3	3	3	0
CO 5	3	3	2	0	1	3	3	3	3	3	0
TOTAL	15	15	11	1	6	15	15	15	15	15	1
SCALED VALUE	3	3	3	1	2	3	3	3	3	3	1
0 - No Relation, 1 –	Low Re	lation, 2	2- Medi	ium Re	lation, 3	3- High	Relatio	n		1	1

CO	URSE NA	ME	Numerical M	ethods w	vith MATLAB	L	Т	Р	C
CO	URSE CO	DE	Σ	KMT504	С	3	1	0	4
С	Р	Α				L	Т	Р	H
4	0	0				3	1	0	4
PRERE	QUISITE		Algebra and Numb	er systen	ns				
On succe	essful com	pletion of	this course, the stu	dents wi	ll be able to:				
		COL	URSE OUTCOME	S		DOMA	IN	LEV	EL
C O 1	Demonst	rate to rec	cognize and use of M	IATLAE	3.	Cogniti	ve	Underst	anding
CO 2	write, tes		modular, and syste bug sequential MA			Cogniti	ve	Apply	ying
CO 3		-	g and construct poly functions using MA		for a given set of	Cogniti	ve	Apply	ying
CO 4		by using	solutions of alge bisection method a			Cogniti	ve	Apply	ying
CO 5		•	erential equations nuds with MATLAB.	umericall	y using Euler and	Cogniti	ve	Appl	ying
UNIT 1							•	9 -	+ 3
MATLA Special V		ns – Using	ing Started – Solvin Predefined Functio					al Limi	tations
UNIT 2	T (1 ()	(T	D' ' 1 D' #		D' ' 1 D	ат	7 1.4		+ 3
Plotting:		on to Iwo	-Dimensional Plott from the Worksh	lng - In	ree-Dimensional P	10tting – I		PIOLS II	om th
			– Input/Functions –				LAD.	muodu	CHOII
UNIT 3		v arrables	input i unctions	Stateme		iuctures.		9.	+ 3
	al Technic	mes: Intro	oduction – Curve	Fitting:	Linear and Polyn	omial Res	pression		
	-	•	merical Integration -	<u> </u>	· · · · · · · · · · · · · · · · · · ·		5		
UNIT 4			0					9 -	+ 3
Curve Fi	itting – Fi	tting Line	ar and parabolic c	urves by	the method of le	east square	es prino	ciples-	Solvin
			equations-Bisection a care equations – Gau						metho
UNIT 5									+ 3
Numeric	al integrat	ions using	vard and backward Trapezoidal and S		•		-		
	TURE	45	th order method.	15	PRACTICAL	0	TOT	ΑΤ	60
	IUNE	-3		10	INACIICAL	U			00
Text Boo	ok								

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				CO	s VS PO	Os					
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	3	3	2	0	1	3	3	3	3	3	0
CO 3	3	3	2	0	1	3	3	3	3	3	0
CO 4	3	3	2	0	1	3	3	3	3	3	0
CO 5	3	3	2	0	1	3	3	3	3	3	0
TOTAL	15	14	9	0	4	14	14	14	15	14	0
SCALED VALUE	3	3	2	0	1	3	3	3	3	3	0
0 - No Relation, 1 -	Low Re	lation, 2	2- Medi	ium Re	lation, 1	3- High	Relatio	n	<u>I</u>	1	1

	URSE NA	ME	Discret	te Mathematics	L	Т	Р	C
CO	URSE CC	DDE	X	KMT504D	3	1	0	4
С	Р	Α			L	Т	Р	H
4	0	0			3	1	0	4
PRERE	QUISITE		Algebra and Numb	er Systems				
On succ	essful com	pletion of	this course, the stu	dents will be able to:				
		CO	URSE OUTCOMES	S	DOMA	IN	LEV	EL
CO 1			otation of mathemati al expressions and vi	cal logic to write English ce-versa.	Cogniti	ve	Appl	ying
CO 2		Ŭ	aic structure of group		Cogniti	ve	Underst	anding
CO 3	Simplify	and prove	e Boolean expression	s.	Cogniti	ve	Analy	zing
CO 4	Constru	ct non-det	erministic finite state	e machine.	Cogniti	ve	Appl	ying
CO 5	Demonst systems.	t rate the a	bility to convert num	nerals into various number	Cogniti	ve	Underst	anding
UNIT 1							9	+3
Equivale UNIT 2 Algebra UNIT 3 Lattices	ic Structur and Bool	nulae - Du res: Group lean Algel	ality Laws - Normal os and Monoids - Sin bra: Lattices and Po	nple Properties - Group Cod	les.		9	+3
Algebra	- Gating N	etworks -	Minimal sums of Pro	oducts - Karnaugh maps.			9	+3
LINIT 4		~	chines Language - T	The Set Theory and Strings	- Finite S	tate N		
	ges: Finite	State Mac	childs Danguage 1					· A IIr
Languagencounte	er - Finite S		ine - a Second encou	nter.			0	
Languag encounte UNIT 5	er - Finite S	State mach	ine - a Second encou		version fr	om o		+3
Languag encounte UNIT 5 Number Binary a	er - Finite S system a	State mach nd codes:	ine - a Second encou : Decimal, Binary, (nter. Octal, Hexadecimal - Conv vision - BCD - Weighted ex			ne to an	+3 other -
encounte UNIT 5 Number Binary a code, Er	er - Finite S system a ddition, su	State mach nd codes:	ine - a Second encou : Decimal, Binary, (Octal, Hexadecimal - Conv			ne to and y Code -	+3 other -
Langua; encounte UNIT 5 Number Binary a code, Er	er - Finite S system a ddition, su ror Detecti TURE	Mate mach nd codes: abtraction 1 ng Code.	ine - a Second encou Decimal, Binary, (multiplication and di	Octal, Hexadecimal - Conv vision - BCD - Weighted ex	cess time	- Gra	ne to and y Code -	+ 3 other - ASCI
Langua encounte UNIT 5 Number Binary a code, Er LEC Text Bo 1. Tren	system a system a addition, su ror Detecti TURE ok abley and N	State mach nd codes: Ibtraction n ng Code. 45 Manohar -	ine - a Second encou Decimal, Binary, (multiplication and div TUTORIAL	Octal, Hexadecimal - Conv vision - BCD - Weighted ex	ccess time	- Gra	ne to and y Code -	+3 other - ASCI 60
Langua encounte UNIT 5 Number Binary a code, Er LEC Text Bo 1. Tren	er - Finite S system a iddition, su ror Detecti TURE ok ibley and N raw Hill, N	State mach nd codes: Ibtraction n ng Code. 45 Manohar -	ine - a Second encou Decimal, Binary, (multiplication and di TUTORIAL	Octal, Hexadecimal - Conv vision - BCD - Weighted ex 15 PRACTICAL	ccess time	- Gra	ne to and y Code -	+3 other - ASCI 60
Langua; encounte UNIT 5 Number Binary a code, Er LEC Text Bo 1. Trem McG Referen	er - Finite S system a iddition, su ror Detecti TURE ok ibley and N raw Hill, N ces	State mach nd codes: Ibtraction i ing Code. 45 Manohar - New Delhi	ine - a Second encou Decimal, Binary, (multiplication and di TUTORIAL Discrete Mathematic) 35 th reprint 2008.	Octal, Hexadecimal - Conv vision - BCD - Weighted ex 15 PRACTICAL	0 0 0 to Con	- Gra	rAL Science	+3 other ASCI 60

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	COs VS POs											
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	РО	PSO1	PSO2	
CO 1	3	3	2	0	1	3	3	3	3	3	0	
CO 2	3	2	1	0	0	2	2	2	3	2	0	
CO 3	3	3	3	1	2	3	3	3	3	3	1	
CO 4	3	3	2	0	1	3	3	3	3	3	0	
CO 5	3	2	1	0	0	2	2	2	3	2	0	
TOTAL	15	13	9	1	4	13	13	13	15	13	1	
SCALED VALUE	3	3	2	1	1	3	3	3	3	3	1	
0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation												

CO	URSE NA	ME		Vedic I	Mathema	tics - II	L	Т	Р	С
CO	URSE CO	DE			XMT505		1	1	0	2
С	Р	A					L	Т	Р	H
2	0	0					1	1	0	2
PREREC	QUISITE		Alg	ebra and Numb	er System	18				
On succe	essful com	pletion of	f this	course, the stu	idents wil	l be able to:				
		CO	URSI	E OUTCOME	S		DOMA	IN	LEV	EL
CO 1	Solve the	linear eq	uatior	is in two variab	oles faster	and with ease.	Cognitiv	ve	Appl	ying
CO 2	Utilize v Polynom		nd cro	osswise techni	que for	nultiplication of	Cognitiv	ve	Apply	ying
CO 3	Explaint Determin	he Intro	oductio	on and hist	tory of	Matrices and	Cognitiv	ve	Underst	anding
CO 4	Explain	different f	forms	of straight line	s.		Cognitiv	ve	Underst	anding
CO 5	Solve sy faster and			taneous linear	equation	s with matrices	Cognitiv	ve	Apply	ying
UNIT 1	Solution									3+3
				 Solutions of linear equation 		equations - Solution	ons of lin	ear eq	uations	in two
UNIT 2				inical equation	IS III two v					3+3
			cubic	polynomials, h	nomogene	ous expressions of	the secon	d degre	ee –	
_					r special	techniques -Multi	plication	of Pol	ynomial	s using
	and cross VedicMa									3+3
Introduct	ion and his	story of N	latrice	es and Determine	nants - Ma	atrices and Determ	inants of t	hird or	der - Inv	
Matrices.										•••••••
	Vedic Ge									3+3
						Cyclic Quadrilate	eral, Squa	res, an	d the C	Circle -
				ormation of sir		es.				2+2
				<mark>ltaneous equat</mark> ariables - Simi		Equation with 3 V	ariables by	deterr	ninant n	<u>3+3</u>
	TURE	15		TUTORIAL	15	PRACTICAL	0	TOT	1	30
Text Boo	k									
		atics. Swa	ami B	harati Krishna	Trithaii, N	Iotilal Banarsidas,	New Dell	ni,1990	•	
Reference		,			J , - `					
						Sunil M. Patankar				
		dic Mathe	ematic	s, Rajesh Kum	ar Thakur	, Rupa Publication	s, New De	lhi,201	9.	
E-Refere	ences									
-	://www.fu									
2. http	://www.yo	outube.com	m/wat	ch?v=b3PFjsU	gULM&f	eature=youtu.be				

				CO	s VS PO	Os					
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	РО	PSO1	PSO2
CO 1	3	3	2	0	1	3	3	3	3	3	0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	2	1	0	0	2	2	2	3	2	0
CO 4	3	3	2	0	1	3	3	3	3	3	0
CO 5	3	3	2	0	1	3	3	3	3	3	0
TOTAL	15	13	8	0	3	13	13	13	15	13	0
SCALED VALUE	3	3	2	0	1	3	3	3	3	3	0
0 - No Relation, 1 -	Low Re	lation, 2	2- Medi	ium Re	lation, 3	3- High	Relatio	n		1	L

CO	URSE NA	ME	Python Programming	L	Т	P	C
CO	URSE CO	DE	XMT506A	2	1	0	3
С	Р	A		L	Т	Р	Н
3	0	0		2	1	0	3
PREREC	QUISITE		Basic programme language				
On succe	ssful comp	oletion of	this course, the students will be able to:				
		CO	URSE OUTCOMES	DOMAI	N	LEVI	EL
CO 1		t rate the	e basics of object-oriented concepts and ng.	Cognitiv	e l	Jndersta	nding
CO 2		he array	develop the programs using selection and	Cognitiv	e	Apply	ing
CO 3		ethesignit ariousapp	ficanceoffunction, strings and modules; and Imple lications.	Cognitiv	e (Jndersta	nding
CO 4	Demonst	trate the	List, Tuples and Dictionary; and write program es and dictionary.	Cognitiv	e	Apply	ing
CO 5			data by handlingthefilesinPython.	Cognitiv	e	Analyz	zing
UNIT 1	Basicsof	ObjectOri	entedandPythonProgramming			6+	3
Basicsof Keyword Expressio UNIT 2 PythonA ControlS	PythonPro s–Built-in ons– Type Python A rrays:Defi tatements:	ogrammin DataType conversio uraysand ningandP Selection	ymorphism– Inheritance –Abstraction. g:HistoryofPython–FeaturesofPython–Literal–Co ss–OutputStatements–InputStatements – Commons. Control Statements rocessingArrays –Array methods. /ConditionalBranchingstatements–if,if-else,nested oop, for loop, else suite in loop and nestedloops.	ents– Inde	f-else	n– Oper 6+ state	ators– 3 ments.
	statements		oop, for loop, else suite in loop and nestedloops.	JumpStater	nents.	oreak,ee	minue
UNIT 3	Function	s,Stringsa	ndModules			6 +	3
Recursion StringCo	n.PythonSt	trings:Stri Modules:	ion – Function Call – Variable Scope and its ingoperations–ImmutableStrings–Built-inStringM Importstatement–ThePythonmodule –dir() function	lethodsand	Function	ons–	
UNIT 4	Lists,Tup	lesandDi	ctionaries			6+	3
List Met Difference Creating,	hods. Tup æ Accessing	les: Crea betweer Updating	s values in List – Updating values in Lists – Nes ting, Accessing, Updating and Deleting Elemen n lists and tuples. gandDeletingElementsinaDictionary–DictionaryF Dictionaries.	ntsin a tup Di	le – N Ictional	ested tu ries	
			ataAnalysis	and W. '.'	£1	6+	3
File Hand	lling: Type	es of files	in Python – Opening and Closing files – Reading	and Writh	ngtiles		

Splittingwords–Filer FilePositionsRenami FundamentalsofData	ingandde	letingfi			isusing	Python:	Loaddat	aintoaDa	ataFram	e–	
LECTURE	30		UTORI		15	PRAC	CTICAI	0	Τ	OTAL	45
Text Book											
 ReemaThareja, "F ess. Dr.R.Nageswaral References 											ersityPr
 VamsiKurama, "F MarkLutz, "Learn AdamStewarts, "F FabioNelli, "Pythe FabioNelli, "Pythe KennethA.Lambe E-References NPTEL Course https://onlineco Python for Beg Python for Fun free/courses/py Python Certific Crash Course of 	vingPytho PythonPr onDataA ert, "Func e in Pyth ourses.np ginners, P adamenta /thon-fur cate Cour	on",Orie ogramn nalytics lamenta on for I otel.ac.in https://a lls for B ndament rse, http	elly. ning",Or s:WithPa lsofPyth Data Scie n/noc22_ lison.con lison.con tals-for-los://data-	nline. andas,N hon—Fir ence by _cs32/p m/cours s, https: beginne flair.tra	SumPy, sstProgr Prof. Foreview se/pytho ://www ers aining/c	andMatj ams",2 ⁿ Ragunatl on-for-b .mygrea	olotlib", ^d Edition han Ren eginners tlearnin	APress. , <u>Cengag</u> gasamy, gasamy, s g.com/ad	IIT Ma	dras,	
				CO	s VS P	Os					
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	РО	PSO1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	3	3	2	0	1	3	3	3	3	3	0
CO 3	3	2	1	0	0	2	2	2	3	2	0
CO 4	3	3	2	0	1	3	3	3	3	3	0
CO 5	3	3	3	1	2	3	3	3	3	3	1
TOTAL	15	13	9	1	4	13	13	13	15	13	1
SCALED VALUE	3	3	2	1	1	3	3	3	3	3	1
0 - No Relation, 1 -	Low Re	lation, 2	2- Medi	um Re	lation,	3- High	Relatio	n			<u> </u>
1-5→1, 6-10→2, 11-	15→3										

CO	URSE NA	ME		Mathem	natics for	Finance	L	Т	Р	C
CO	URSE CO	DE		2	XMT506	В	2	1	0	3
С	P	A					L	Т	Р	H
3	0	0					2	1	0	3
PRERE	QUISITE		Basi	c Economics						
On succ	essful com	pletion of	f this c	ourse, the stu	idents wi	ll be able to:				
		CO	URSE	OUTCOME	S		DOMA	IN	LEV	EL
CO 1	Estimate	Time val	lue of 1	money and cor	npound i	nterest functions.	Cognitiv	ve	Evalua	ting
CO 2		breakeve al decisio	-		use of b	eakeven point in	Cognitiv	ve	Evalua	ting
CO 3	Estimate	Annuitie	es and I	Equation of Va	alue Disc	ounting	Cognitiv	ve	Evalua	ting
CO 4				f return with llowance for c		e to IRR method ins.	Cognitiv	ve	Evalua	ting
CO 5	Estimate	stock and	d bond	price.			Cognitiv	ve	Evalua	ting
UNIT 1	Introduct					ective rate, nomina			6 -	-
UNIT 3 Discrete value an flat rate a UNIT 4 Introduct payback UNIT 5 Long-term	Annuities and contin d yield on and APRs Capital B ion to finat period; pro Risk and n and shor	Chart – D s and Equa uous cash transactio udgeting ncial state jects with insurance t-term ins	Decision ation on flows on, pro Techn ement, n differ e surance	n making – lev f Value Disco ; level annuitie bability of cas iques assessing fina ent live.	unting ar es, deferr sh flows, ncial perf ce, Endov	operating – financi ad Accumulation ed and increasing/ higher discount, l formance, net prese wment, and annuiti iple, coinsurance p	decreasing oan schedu ent value, in es, Insuran	annuit iles; co nternal	6 - ies, equa onsumer 6 - rate of 1 cies,	-3 ttion of credit: -3 eturn, -3
	TURE	30	,	TUTORIAL	15	PRACTICAL	0	тот	AL	45
Text Bo	oks		I_		I	1	1	L	I	
Unde Tech 2. Ross Lond	erstanding nology). , S.M., (19 on.	and Buil 999): An	lding H Introd	Financial Intu	ition (Sp thematic	ction to Mathema oringer Undergrad al Finance, Camb l Mathematics, Pre	uate texts ridge Univ	in M	athemati	cs and

References

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	COs VS POs												
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2		
CO 1	3	3	3	2	3	3	3	3	3	3	2		
CO 2	3	3	3	2	3	3	3	3	3	3	2		
CO 3	3	3	3	2	3	3	3	3	3	3	2		
CO 4	3	3	3	2	3	3	3	3	3	3	2		
CO 5	3	3	3	2	3	3	3	3	3	3	2		
TOTAL	15	15	15	10	15	15	15	15	15	15	10		
SCALED VALUE	3	3	3	2	3	3	3	3	3	3	2		
0 - No Relation, 1 -	0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation												

SEMESTER VI

CC	URSE NA	ME	Com	plex Ana	lysis	L	Т	Р	C
CC	OURSE CO	DE		XMT601		3	1	0	4
С	P	A				L	Т	P	H
4	0	0				3	1	0	4
PRERE	QUISITE		Real Analysis						
On succ	essful com	pletion of	this course, the stu	dents wil	l be able to:				
		CO	URSE OUTCOME	S		DOMA	IN	LEV	EL
CO 1	Determin differenti		ner the given fur lytic.	nction is	Continuous /	Cogniti	ve	Evalua	ıting
CO 2	transform	ation	age of given region			Cogniti	ve	Evalua	ıting
CO 3	Explain	Cauchy's	theorem and Cauchy	Integral t	formula	Cogniti	ve	Understa	anding
CO 4			ulus of convergence ies expansion	e of a give	n function using	Cogniti	ve	Evalua	ıting
CO 5	Evaluate theorem	complex	contour integrals u	using the	Cauchy Residue	Cogniti	ve	Evalua	ıting
UNIT 1	-								+ 3
			ns of a complex variations variations					ous func	tions
	Bilinear			s – Allalyt	ic functions – Har		ictions.	9 -	+ 3
			ansformations – Bili	inear trans	sformation – cross	s ratio – f	ixed po		
transfor	mation – soi	ne specia	l bilinear transforma				-		
	Complex	<u> </u>							+ 3
			gral – Cauchy's The						
	a's theorem		- Cauchy's inequal	ity – Liou	ville's theorem –	rundamer	ital theo	orem or	argeor
	Series Ex		1					9 -	+ 3
		-	s – Laurent's series	– Zeros d	of an analytic fun	ction – si	ngularit		
Rieman	n's theorem	- meromo	orphic function.		-		-	·	
	Calculus								⊦ 3
	-		e theorem - Argun	nent theor	em – Rouche's t	heorem -	Evaluat	ion of o	definit
-	-Contour in	_ -				0	mom		
LEC	CTURE	45	TUTORIAL	15	PRACTICAL	0	TOT	AL	60
Text Bo									
		ysis" by S	Arumugam, A. Tha	ngapandi	Isaac, A. Somasu	ndaram, S	citech P	ublicati	ons,
2014			a 1 1 1	D	•				
τ	Unit I	:	Chapter 1 (Sec: 1.1)						
,	Init II		Chapter 2 (Sec: 2.1 Chapter 2 (Sec: 2.1		0				
	Jnit II	:	Chapter 3 (Sec: 3.1	– 5.5), Pa	ges: 74 – 100				

Unit III		Chapter 6(Sec: 6.1 – 6.4), Pages: 132 – 170
	•	
Unit IV	:	Chapter 7(Sec: $7.1 - 7.4$), Pages: $173 - 207$
Unit V	:	Chapter 8(Sec: 8.1 – 8.3), Pages: 209 – 254

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- 3. <u>https://nptel.ac.in</u>

COs VS Pos												
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	РО	PSO1	PSO2	
CO 1	3	3	3	2	3	3	3	3	3	3	2	
CO 2	3	3	3	2	3	3	3	3	3	3	2	
CO 3	3	2	1	0	0	2	2	2	3	2	0	
CO 4	3	3	3	2	3	3	3	3	3	3	2	
CO 5	3	3	3	2	3	3	3	3	3	3	2	
TOTAL	15	14	13	8	12	14	14	14	15	14	8	
SCALED VALUE	3	3	3	2	3	3	3	3	3	3	2	
0 - No Relation, 1 -	Low Re	lation, 2	2- Medi	ium Re	lation,	3- High	Relatio	n		1	1	
1-5→1, 6-10→2, 11-	15→3											

CO	URSE NA	ME	Ν	Iechanic	5	L	Т	Р	C
CO	URSE CC	DDE	2	XMT602		3	1	0	4
С	Р	Α				L	Т	Р	Н
4	0	0				3	1	0	4
PRERE	QUISITE	I	Algebra & Trigono	metry					
On succ	essful com	pletion of	this course, the stu	dents wil	l be able to:				
		CO	URSE OUTCOMES	5		DOMAI	N	LEVI	EL
CO 1			essary conditions n by various forces	for the	equilibrium of	Cognitiv	ve L	Indersta	nding
CO 2	Analyze	various sy	vstems of forces			Cognitiv	ve	Analyz	zing
CO 3	Explain	the relatio	n between work and	power		Cognitiv	ve L	Indersta	nding
CO 4	Illustrat forces	e the effe	cts of a projectile a	cted upo	n various	Cognitiv	ve L	Indersta	nding
CO 5	Apply th	e theory o	f central orbit to stud	y planeta	ry motions.	Cognitiv	ve	Apply	ing
UNIT 1	Force:) + 3
			ltantoftwoforcesonap		Equilibriumofa	Particle:Ec	luilibriu	imofapa	rticle-
	Forces o	_	leon an inclinedplane	.				0) + 3
			General motion	of a b	odv –Equivalents	systemsoff	orces-P		
			- A specific reduction						
UNIT 3		nergy and) + 3
			f force–Power-Rect	ilinearMo	otionunderVarying	Force:Sim	pleHari	nonicM	lotion-
	Projectil	-	averticalline.					G) + 3
			eprojectedonaninclin	ed plane					
UNIT 5	Central		• •					9) + 3
			Conicasacenteredorbi						
LEC	TURE	45	TUTORIAL	15	PRACTICAL	0	TOTA	L	60
Р	lechanics, Duraipand		iDuraipandian,Mutha l Edition 2005.	amizhJaya	apragasam,S.Chan	d&Compa	nyLtd.,	Fourth	
Reference	es								
 The Eng 	Elements	ofStaticsar Aechanics	dDynamics,A.Ruinaa dDynamics,S.L.Lon : Statics, J.L.Meriam	ey,Cambi	idgeUniversityPre	ss,1904.		nsPvt	

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- 3. <u>https://www.youtube.com/watch?v=FD4BQjMuhYY</u>
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PO 1		COs VS Pos												
101	PO2	PO3	PO4	PO5	PO6	PO7	PO8	РО	PSO1	PSO2				
3	2	1	0	0	2	2	2	3	2	0				
3	3	3	1	2	3	3	3	3	3	1				
3	2	1	0	0	2	2	2	3	2	0				
3	2	1	0	0	2	2	2	3	2	0				
3	3	2	0	1	3	3	3	3	3	0				
15	12	7	1	3	12	12	12	15	12	1				
3	3	2	1	1	3	3	3	3	3	1				
	3 3 3 3 15 3	3 3 3 2 3 2 3 2 3 3 15 12 3 3	3 3 3 3 2 1 3 2 1 3 3 2 15 12 7 3 3 2	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	3 3 3 1 2 3 3 2 1 0 0 2 3 2 1 0 0 2 3 2 1 0 0 2 3 3 2 1 3 12 3 3 2 0 1 3 15 12 7 1 3 12 3 3 2 1 1 3	3 3 3 1 2 3 3 3 2 1 0 0 2 2 3 2 1 0 0 2 2 3 2 1 0 0 2 2 3 3 2 0 1 3 3 15 12 7 1 3 12 12 3 3 2 1 1 3 3	3 3 3 1 2 3 3 3 3 2 1 0 0 2 2 2 3 2 1 0 0 2 2 2 3 2 1 0 0 2 2 2 3 3 2 1 3 3 3 3 3 3 2 0 1 3 3 3 3 3 2 0 1 3 3 3 15 12 7 1 3 12 12 12	3 3 3 1 2 3 3 3 3 3 2 1 0 0 2 2 2 3 3 2 1 0 0 2 2 2 3 3 2 1 0 0 2 2 2 3 3 2 1 0 0 2 2 2 3 3 3 2 0 1 3 3 3 3 15 12 7 1 3 12 12 15 3 3 2 1 1 3 3 3 3	3 3 3 1 2 3 3 3 3 3 3 2 1 0 0 2 2 2 3 2 3 2 1 0 0 2 2 2 3 2 3 2 1 0 0 2 2 2 3 2 3 2 1 0 0 2 2 2 3 2 3 3 2 0 1 3 3 3 3 3 15 12 7 1 3 12 12 15 12 3 3 2 1 1 3 3 3 3 3				

0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation

 $1\textbf{-}5 {\rightarrow} 1, 6\textbf{-}10 {\rightarrow} 2, 11\textbf{-}15 {\rightarrow} 3$

CO	URSE NA	ME		Optimiz	ation Tec	hniques	L	Т	Р	C
CO	URSE CC	DE			XMT603		3	1	0	4
С	Р	Α					L	Т	Р	Н
4	0	0					3	1	0	4
PREREC	QUISITE		Alg	gebra						
On succe	essful com	pletion of	f this	course, the stu	dents wil	l be able to:				
		CO	URS	E OUTCOME	S		DOMAI	N	LEVI	EL
CO 1	Solve lin	ear progra	mmi	ng problem usir	ng Simple	x Method	Cognitiv	ve 🛛	Apply	ing
CO 2		MODI tation pro			optimu	m solution of	Cognitiv	ve 🛛	Apply	ing
CO 3	two-pers	on zero su	m ga	imes	_	nts for the given	Cognitiv	/e	Apply	ing
CO 4	Determi & CPM	ne the min	nimu	m time to comp	olete a pro	ject using PERT	Cognitiv	/e	Evalua	ting
CO 5	concepts	, and tech r deman	nique	es as they relate	to the en	ent's principles, tire supply chain transformation	Cognitiv	/e	Analyz	zing
UNIT 1	processes	,,							9 +	3
Linear F	rogramm	ing Prob	lem:	Mathematical	formulatio	on of LPP - Simp	olex Metho	d - Art		
	e - Concep	t of Duali	ty - P	rimal and Dual	Problems	- Duality - Dual S	Simplex Me	ethod.		
UNIT 2			.т 1	W. C		r	.1 1 17	11	9+	
-						Iatrix Minima m		ogel's A	Approx	mation
			0	•		ignment Problem		g Sales	man Pro	blem.
UNIT 3						0		0	9 +	
						ne Maximin - Mir				vithout
	oints - Mix	ed Strateg	gies -	Graphical Solu	tion of 2	x n and m x 2 gam	ies - Domin	ance P		_
UNIT 4					1 11	•		· 1	9+	
		•		tical Path Methor		ic components - I	Rules of ING	etwork	Constru	ction -
UNIT 5		THELWOIK	- CII		<u>0u - 1 ER 1</u>	Calculation.			9+	3
	v Control	: Introduc	ctions	s - Types of In	ventories	- Inventory decis	sions - Det	ermini		
						Problems with no				
shortage	s - Product	ion Proble	ems v	with shortages. I	EOQ Prob	lems with One an	d More Pri	ce brea	ks	
LEC	TURE	45		TUTORIAL	15	PRACTICAL	0	TOTA	AL	60
Text Boo	ok	1			L	I				
1. Kanti editic	± ·	.K. Gupta	and	Manmohan - O	perations	Research - Sultan	Chand & S	ons – 2	2006, 12	th
Reference										

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https://web.stanford.edu/group/sis1/k12/optimization/#!index.md[StandardUniversity]

				CO	s VS P	Os					
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	РО	PSO1	PSO2
CO 1	3	3	2	0	1	3	3	3	3	3	0
CO 2	3	3	2	0	1	3	3	3	3	3	0
CO 3	3	3	2	0	1	3	3	3	3	3	0
CO 4	3	3	3	2	3	3	3	3	3	3	2
CO 5	3	3	3	1	2	3	3	3	3	3	1
TOTAL	15	15	12	3	8	15	15	15	15	15	3
SCALED VALUE	3	3	3	1	2	3	3	3	3	3	1
0 - No Relation, 1 –	Low Re	lation, 2	2- Medi	ium Re	lation,	3- High	Relatio	n		1	

 $1\textbf{-}5 {\rightarrow} 1, \textbf{6-}10 {\rightarrow} 2, 11\textbf{-}15 {\rightarrow} 3$

	URSE NA	ME	Industrial	Mathematics 4.0	L	T	Р	C
CO	URSE CO	DE	X	MT604A	3	1	0	4
С	P	Α			L	T	Р	Н
4	0	0			3	1	0	4
PRERE	QUISITE		Statistics					
On succ	essful com	pletion of	this course, the stud	dents will be able to:				
		COU	JRSE OUTCOMES	5	DOMA	IN	LEV	EL
CO 1	Infer th Intelliger		for adopting Indu	stry 4.0 and Artificial	Cogniti	ve	Underst	anding
CO 2	Ŭ		eed for digital transfo	ormation.	Cogniti	ve	Underst	anding
CO 3	Apply th	e industry	4.0 tools.		Cogniti	ve	Appl	ying
CO 4	Analyze	the applica	tions of Big Data.		Cogniti	ve	Analy	zing
CO 5	Examine	the applic	ations and security o	of IoT Applications	Cogniti	ve	Analy	zing
UNIT 1	Industry	4.0				I	9+	-3
				finition – Goals and Desig				
-	-		ficial Intelligence (A	AI) – Industrial Internet of T	Things - C	yber	Security -	– Clou
	ented Reali	•						
	Artificia						9+	-
				– What & Why? - History				
				plication Domains and Too	ls - Assoc	ciated	Technol	ogies o
	-		Challenges of AI.					
	Big Data				C· · · ·	F	9+	
				rminologies - Big Data De	finitions -	Esse		1 m l lot
Big Data	: Evolutio							-
Big Data in Indust	: Evolutio ry 4.0 - B	ig Data M	erits and Advantage	s - Big Data Components :	Big Data	ı Cha		cs - Bi
Big Data in Indust Data Pro	: Evolutio ry 4.0 - B cessing Fra	ig Data M ameworks	erits and Advantage - Big Data Applicat	s - Big Data Components : ions - Big Data Tools - Big	Big Data Data Dor	ι Cha main	Stack : B	cs - Bi big Dat
Big Data in Indust Data Pro in Data S	: Evolutio ry 4.0 - B cessing Fra Science - E	ig Data M ameworks Big Data ir	erits and Advantage - Big Data Applicati I IoT - Big Data in I	s - Big Data Components : ions - Big Data Tools - Big Machine Learning - Big Da	Big Data Data Doi Ita in Data	a Cha main abase:	Stack : B s - Big D	cs - Bi Sig Dat ata Us
Big Data in Indust Data Pro in Data S cases Big	: Evolution ry 4.0 - B cessing Fra Science - E g Data in	ig Data M ameworks Big Data ir Social Ca	erits and Advantage - Big Data Applicati I IoT - Big Data in I uses - Big Data for	s - Big Data Components : ions - Big Data Tools - Big Machine Learning - Big Da Industry - Big Data Role	Big Data Data Dor Data in Data Sand Ski	a Cha main abases lls -E	Stack : B s - Big D Big Data	cs - Bi lig Dat ata Us Roles
Big Data in Indust Data Pro in Data S cases Big Learning	: Evolutio ry 4.0 - B cessing Fra Science - E g Data in g Platforms	ig Data M ameworks Big Data ir Social Ca ; Internet	erits and Advantage - Big Data Applicat IoT - Big Data in I uses - Big Data for of Things (IoT) : Int	s - Big Data Components : ions - Big Data Tools - Big Machine Learning - Big Da Industry - Big Data Role troduction to IoT - Archite	Big Data Data Dor Data in Data Sand Ski	a Cha main abases lls -E	Stack : B s - Big D Big Data	cs - Bi lig Dat ata Us Roles
Big Data in Indust Data Pro in Data S cases Big Learning IoT - Dev	: Evolutio ry 4.0 - B cessing Fra Science - E g Data in Platforms veloping Io	ig Data M ameworks Big Data ir Social Ca ; Internet of Applica	erits and Advantage - Big Data Applicati IoT - Big Data in I uses - Big Data for of Things (IoT) : Int tions - Applications	s - Big Data Components : ions - Big Data Tools - Big Machine Learning - Big Da Industry - Big Data Role troduction to IoT - Archite of IoT - Security in IoT.	Big Data Data Dor Data in Data Sand Ski	a Cha main abases lls -E	Stack : B s - Big D Big Data Technolo	cs - Bi big Dat ata Us Roles gies fo
Big Data in Indust Data Pro in Data S cases Big Learning IoT - Dev UNIT 4	: Evolutic ry 4.0 - B cessing Fra Science - E g Data in Platforms veloping Ic Applicat	ig Data M ameworks Big Data ir Social Ca ; Internet oT Applica ions And	erits and Advantage - Big Data Application IoT - Big Data in Ion Uses - Big Data for of Things (IoT) : Int tions - Applications Tools Of Industry 4	s - Big Data Components : ions - Big Data Tools - Big Machine Learning - Big Da Industry - Big Data Role troduction to IoT - Archite of IoT - Security in IoT .	Big Data Data Do ta in Data s and Ski cture of I	a Cha main abases 11s -E oT - '	Stack : B s - Big D Big Data Technolo 9+	cs - Bi big Dat ata Us Roles gies fo - 3
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Big Data in Indust Data Pro in Data S cases Big Learning IoT - Dev UNIT 4 Applicati Transpor Tools fo	: Evolution ry 4.0 - B cessing Fra Science - E g Data in Platforms veloping Ion Applicat ions of Ion tation and r Artificial	ig Data M ameworks Big Data ir Social Ca ; Internet DT Applica ions And Γ – Manuf Logistics	erits and Advantage - Big Data Application I IoT - Big Data in I uses - Big Data for of Things (IoT) : Inter- tions - Applications Fools Of Industry 4 Facturing – Healthca - Impact of Industry	s - Big Data Components : ions - Big Data Tools - Big Machine Learning - Big Da Industry - Big Data Role troduction to IoT - Archite of IoT - Security in IoT . .0 re – Education – Aerospac	Big Data Data Dota ata in Data s and Ski cture of I ce and De Business,	a Cha main abase: lls -E oT - ' fense , Gov	Stack : B s - Big D Big Data Technolo 9+ – Agricu ernment,	cs - Bi ig Dat ata Us Roles gies fo -3 ulture People
Big Data in Indust Data Pro in Data S cases Big Learning IOT - Dev UNIT 4 Applicati Transpor Tools fo Robotics	: Evolution ry 4.0 - B cessing Fra Science - E g Data in Platforms veloping Ion Applicat ions of Ion tation and r Artificial	ig Data M ameworks Big Data ir Social Ca ; Internet <u>oT Applica</u> ions And Γ – Manuf Logistics I Intelliger	erits and Advantage - Big Data Application I IoT - Big Data in I uses - Big Data for of Things (IoT) : Inter- tions - Applications Fools Of Industry 4 Facturing – Healthca - Impact of Industry	s - Big Data Components : ions - Big Data Tools - Big Machine Learning - Big Da Industry - Big Data Role troduction to IoT - Archite of IoT - Security in IoT .	Big Data Data Dota ata in Data s and Ski cture of I ce and De Business,	a Cha main abase: lls -E oT - ' fense , Gov	Stack : B s - Big D Big Data Technolo 9+ – Agricu ernment,	cs - Bi ig Dat ata Us Roles gies fc -3 ulture People ty, Io7
Big Data in Indust Data Pro in Data S cases Big Learning IoT - Dev UNIT 4 Applicati Transpor Tools fo Robotics UNIT 5	: Evolution ry 4.0 - B cessing Fra Science - E g Data in Platforms veloping Io Applicat ions of Io tation and r Artificial Jobs 203	ig Data M ameworks Big Data ir Social Ca ; Internet <u>oT Applica</u> <u>ions And</u> Γ – Manuf Logistics I Intelliger 0	erits and Advantage - Big Data Application I IoT - Big Data in I uses - Big Data for of Things (IoT) : Int tions - Applications Tools Of Industry 4 facturing – Healthca - Impact of Industry ince, Big Data and I	s - Big Data Components : ions - Big Data Tools - Big Machine Learning - Big Da Industry - Big Data Role troduction to IoT - Archite of IoT - Security in IoT .	Big Data Data Don ta in Data s and Ski cture of Io ce and De Business, ality, Aug	a Cha main abase: lls -E oT - ' fense , Gov gment	Stack : B s - Big D Big Data Technolo 9+ – Agricu ernment, red Reali	cs - Bi lig Dat ata Us Roles gies fo -3 ulture People ty, Io7 -3
in Indust Data Pro in Data S cases Big Learning IoT - Dev UNIT 4 Applicati Transpor Tools fo Robotics UNIT 5 Industry	i : Evolutic ry 4.0 - B cessing Fra Science - E g Data in Platforms veloping Ic Applicat ions of Io tation and r Artificial Jobs 203 4.0 - Edu	ig Data M ameworks Big Data ir Social Ca ; Internet \overline{OT} Applica ions And \overline{I} – Manuf Logistics I Intelliger 0 acation 4.0	erits and Advantage - Big Data Applicat IoT - Big Data in I uses - Big Data for of Things (IoT) : Int tions - Applications Tools Of Industry 4 facturing – Healthca - Impact of Industry nee, Big Data and I	s - Big Data Components : ions - Big Data Tools - Big Machine Learning - Big Da Industry - Big Data Role troduction to IoT - Archite of IoT - Security in IoT .	Big Data Data Don ta in Data s and Ski cture of Ic ce and De Business, ality, Aug	a Cha main abase: lls -E oT - ' fense fense gment r Fut	Stack : B s - Big D Big Data Technolo 94 – Agrict ernment, red Realit 94 ure - To	cs - Bi ig Dat ata Us Roles gies fo -3 ulture People ty, Io7 -3 ols for
Big Data in Indust Data Pro in Data S cases Big Learning IoT - Dev UNIT 4 Applicati Transpor Tools fo Robotics UNIT 5 Industry	i : Evolutio ry 4.0 - B cessing Fra Science - E g Data in Platforms veloping Io Applicat ions of Io tation and r Artificial Jobs 203 4.0 - Edu on - Artifi	ig Data M ameworks Big Data ir Social Ca ; Internet \overline{OT} Applica ions And \overline{I} – Manuf Logistics I Intelliger 0 acation 4.0	erits and Advantage - Big Data Applicat IoT - Big Data in I uses - Big Data for of Things (IoT) : Int tions - Applications Tools Of Industry 4 facturing – Healthca - Impact of Industry nee, Big Data and I	s - Big Data Components : ions - Big Data Tools - Big Machine Learning - Big Da Industry - Big Data Role troduction to IoT - Archite of IoT - Security in IoT .	Big Data Data Don ta in Data s and Ski cture of Ic ce and De Business, ality, Aug	a Cha main abase: lls -E oT - ' fense fense gment r Fut	Stack : B s - Big D Big Data Technolo 94 – Agrict ernment, red Realit 94 ure - To	cs - Bi ig Dat ata Us Roles gies fo -3 ulture People ty, Io7 -3 ols for

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	COs VS POs										
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	РО	PSO1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	3	2	0	1	3	3	3	3	3	0
CO 4	3	3	3	1	2	3	3	3	3	3	1
CO 5	3	3	3	1	2	3	3	3	3	3	1
TOTAL	15	13	10	2	5	10	13	13	15	13	2
SCALED VALUE	3	3	2	1	1	2	3	3	3	3	1
0 - No Relation, 1 -	Low Re	lation, 2	2- Medi	ium Re	lation,	3- High	Relatio	on			

CO	URSE NA	ME	Introduction	to Machi	ne Learning	L	Т	P	C
CO	URSE CO	DE	Σ	XMT604B	•	3	1	0	4
С	Р	Α				L	Т	Р	H
4	0	0				3	1	0	4
PRERE	QUISITE		Algebra, Trigonom	etry, Prob	ability and Statist	ics			
On succ	essful com	pletion of	this course, the stu	dents wil	l be able to:				
		COU	URSE OUTCOME	S		DOMA	IN	LEV	EL
CO 1			basics of Artifici ctive Models.	al Intelli	gence, Machine	Cognit	ive	Underst	anding
CO 2	-	-	ficance of Probabilis rning algorithms.	stic and St	ochastic Models	Cognit	ive	Underst	anding
CO 3		e basic su	pervised learning al	lgorithms	and Classify the	Cognit	ive	Apply	ying
CO 4	Analyze	the similar	rities and Grouping ised learning algorit		ined data sets by	Cognit	ive	Analy	zing
CO 5	Evaluate measures		ming models by	using bas	sic performance	Cognit	ive	Evalua	ating
UNIT 1	Basics Co	oncepts of	Machine Learning					9+	- 3
Machine UNIT 2	Learning - Probabili	- Perspecti stic and St	e – Training a simp ves and issues in ma ochastic Models ning – Bayes theore	achine lear	ming.			9 -	+ 3
classifier Hidden I	r, Gibbs alg Markov mo	gorithm, N dels.	aive Bayes classifie					lixture I	Models
	Supervise			anifi anti an	. Desision trace	1. Maara	at Maio		+ 3
Vector N	Aachine, L	ogistic reg	ear regression, Cla ression, Random For propagation.						
UNIT 4		vised Lear	1 1 0					9 -	+ 3
			Unsupervised Clust al Component Analy	•		U	lierarch	ical clu	stering
UNIT 5	Modellin	g and Eval	luation						+ 3
		-	odel, training a mo						
			n, Recall, Sensitivity						
		45	TUTORIAL	15	PRACTICAL	0	TOT	AL	60
			ouli, Saikat Dutt, A a.	mit Kuma	r Das, "Machine I	earning"	, 2 nd Ed	ition, 20	18,

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References

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				CO	s VS PO	Os					
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	3	2	0	1	3	3	3	3	3	0
CO 4	3	3	3	1	2	3	3	3	3	3	1
CO 5	3	3	3	2	3	3	3	3	3	3	2
TOTAL	15	13	10	3	6	13	13	13	15	13	3
SCALED VALUE	3	3	2	1	2	3	3	3	3	3	1
0 - No Relation 1 -	Low Re	lation (2. Medi	ium Re	lation '	High	Relatio	n	•	•	•

0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation

 $1 \text{-} 5 \rightarrow 1, 6 \text{-} 10 \rightarrow 2, 11 \text{-} 15 \rightarrow 3$

	URSE NA	ME	А	stronomy	L	T	P	C	
CC	OURSE CO	DE	X	KMT604C	3	1	0	4	
С	P	A			L	T	Р	Н	
4	0	0			3	1	0	4	
PRERE	QUISITE		Algebra and Trigon	nometry					
On succ	essful com	pletion of	f this course, the stu	dents will be able to:					
		CO	URSE OUTCOMES	S	DOMA	IN	LEV	/EL	
CO 1		e concept d diurnal		ometry to explain celestial	Cogniti	ve	App	ying	
CO 2	Explain	Cognitive		Understanding					
CO 3							Applying		
CO 4	Explaint	he format	ion of moon and its s	surface features.	Cogniti	ve	Unders	tanding	
CO 5	Explain	a brief his	tory of Astronomy.		Cogniti	ve	Unders	tanding	
UNIT 1							9	+ 3	
Refractio		nt Formul	a – Cassini's formul	wilight - Earth - Length of the second secon	Geocentri		allax - E		
Refraction Geocent UNIT 3 Kepler's between UNIT 4 Moon - Surface Eclipses UNIT 5 Planetary	ric Parallax Laws - Ven them - Tim Sidereal M of the Moon y Phenomen	nt Formul - Helioce rification ne - Equat Ionth, Lu n - Meton na - Bode	a – Cassini's formul entric Parallax - Effec of Kepler's Laws - Tr ion of Time - Season nation and Relation ic Cycle - Tides - Ec s law - Elongation -	la - Effects of Refraction - cts of Heliocentric Parallax - rue anomaly, Mean Anomal is - Conversion of Time. between them - Phases of lipses - Shadow Cone - Min Sidereal Period, Synodic p	Geocentri - Aberratio y - Eccent f the Moc himum and period and	on - It tric Ar on - L d Max	Allax - E s Effects 9 nomaly, 9 unar Lib imum nu 9 elation b	ffects c + 3 Relatio + 3 oration mber c + 3 etween	
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Refraction Geocent UNIT 3 Kepler's between UNIT 4 Moon - Surface Eclipses UNIT 5 Planetary them - Astrono LEC	ric Parallax Laws - Ver them - Tim Sidereal M of the Moor y Phenomer Phase - St mical Instru CTURE	nt Formul - Helioce rification ne - Equat Ionth, Lu n - Meton na - Bode ationary	a – Cassini's formul entric Parallax - Effect of Kepler's Laws - Ti ion of Time - Season nation and Relation ic Cycle - Tides - Ect s law - Elongation - Points - Solar Syste	la - Effects of Refraction - cts of Heliocentric Parallax - rue anomaly, Mean Anomal is - Conversion of Time. between them - Phases of lipses - Shadow Cone - Min Sidereal Period, Synodic p em - Stellar Universe - A	Geocentri - Aberratio y - Eccent f the Moc imum and beriod and brief his	on - It tric Ar on - L d Max	Allax - E s Effects 9 nomaly, 9 unar Lit imum nu 9 elation b of Astron	ffects $\frac{1}{4}$ + 3 Relation + 3 mber $\frac{1}{4}$ + 3 etween nomy	
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2. George.O.Abell - Exploration of the Universe Holt, Rinehart& Winston of Canada Ltd; 2nd Revised edition (1 June 1969).

E-References

1. <u>http://bulletin.columbia.edu/columbia-college/departments-</u> instruction/astronomy/#coursestext[ColumbiaUniversity]

2. <u>Https://Www.Physics.Utoronto.Ca/~Jharlow/Teaching/Astron03/Fullnotes/</u>

[UniversityOf Toronto]

COs VS POs												
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	
CO 1	3	3	2	0	1	3	3	3	3	3	0	
CO 2	3	2	1	0	0	2	2	2	3	2	0	
CO 3	3	3	2	0	1	3	3	3	3	3	0	
CO 4	3	2	1	0	0	2	2	2	3	2	0	
CO 5	3	2	1	0	0	2	2	2	3	2	0	
TOTAL	15	12	7	0	2	12	12	12	15	12	0	
SCALED VALUE	3	3	2	0	1	3	3	3	3	3	0	

 $1 ext{-} 5 ext{-} 1, 6 ext{-} 10 ext{-} 2, 11 ext{-} 15 ext{-} 3$

CO	URSE NA	ME		Stocha	astic Pro	cesses	L	T	Р	С
CO	URSE CO	DE		X	MT604I)	3	1	0	4
С	Р	Α					L	Т	Р	Н
4	0	0					3	1	0	4
PRERE	QUISITE		Pro	bability and Stat	istics			1		
On succ	essful com	pletion of	f this	course, the stu	dents wil	l be able to:				
		CO	URS	E OUTCOMES	5		DOMA	IN	LEV	EL
CO 1	continuo	us or disc	rete t		er it has a	her it operates in a continuous or a pe process	Cognitiv	ve	Underst	anding
CO 2	Demonst		it pr			chains after an	Cognitiv	ve .	Underst	anding
CO 3	Explain	the conce	pts of	birth and death	process v	with examples	Cognitiv	ve	Underst	anding
CO 4	Demonst	t rate to re	cogni	ize the concepts	of renew	al process	Cognitiv	ve i	Underst	anding
CO 5	Explain	in detail t	he uti	lity of martingal	es		Cognitiv	ve i	Underst	anding
UNIT 1									9 -	+ 3
Stochasti matricesc UNIT 2	c processe ofaMarkov	es – Mar chain-clas	kov ssifica	Chains-Definition of statesofa	ons – Ex aMarkovo	hasticProcesses-C camples of Marko chain-Recurrence. reterenewal equati	ov Chain-	Fransit	ion pro	+ 3
				e-AqueuingExa						_
	Examples	of contin	nuous	time Markov o	chains-Ge	eneral pure birthpi	rocesses ai	nd Pois	-	+ 3 ocesses-
more abo	out Poisson	n processe	s- A	counter model b	oirth and	death processes-D				
deathprod UNIT 4	cesses-Exa	mplesofb	irthar	d death process	es.				9.	+ 3
	processes	- Defini	tion	of Renewal pro	ocess and	l related concepts	s –Some e	xampl		
	s – More o	n some sp	ecial	Renewalprocess	ses-Ren	ewalequationsande	elementary	Renew		
UNIT 5 Martinga	les-Prelimi	narvdefin	itions	andexamples-S	upermart	ingalesandSub				+ 3 Igales-
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LEC	TURE	45		TUTORIAL	15	PRACTICAL	0	TOT	AL	60
Text Boo	ok									
				sses-SecondEdi ademicPressNev	•	003.				
Reference	ces									
1. "Stoc	hastic	Processes	"	S.K.Srinivasan	and	K.M.Mehata,	Tata	Mcgra	w –	Hill

PublishingCompanyLtd.,NewDelhi.1978.

2. "Stochastic Processes", 2e, Medhi, John Wiley & Sons (Asia) Pte Ltd ,2000.

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http://nptel.ac.in/courses/111/102/111102014/#

http://nptel.ac.in/courses/111/102/111102014/#http://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=214

 $5\& context = graduaterepo \underline{rts}.$

	COs VS POs												
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2		
CO 1	3	2	1	0	0	2	2	2	3	2	0		
CO 2	3	2	1	0	0	2	2	2	3	2	0		
CO 3	3	2	1	0	0	2	2	2	3	2	0		
CO 4	3	2	1	0	0	2	2	2	3	2	0		
CO 5	3	2	1	0	0	2	2	2	3	2	0		
TOTAL	15	10	5	0	0	10	10	10	15	10	0		
SCALED VALUE	3	2	1	0	0	2	2	2	3	2	0		
0 - No Relation, 1 -	Low Re	lation, 2	2- Medi	ium Re	lation, 3	3- High	Relatio)n	I	1	<u> </u>		
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Co	ourse N	lame	Cyber Security	L	Т	Р	С		
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С	Р	A		L	Т	SS	Н		
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Prer	equisi	te	Basic Programming knowledge and technical ski	lls.	I				
On s	success	ful con	pletion of this course, the students will be able	to:					
			Course Outcomes	Don	nain	Le	evel		
CO	1		rstand the fundamentals of Cyber Security and chnologies.	Cogn	itive	Unders	standing		
CO	2	Under securi	rstand the organizational structure of Cyber ty	Cogn	itive	Unders	standing		
CO	3	Unde	Cogn	itive	Unders	standing			
CO	4	Under	Cogn	itive	Understanding				
CO	CO 5 Understand and Apply the Cyber security practices Cognitive								
UNI	T 1	INTR	ODUCTION			3+3			
Regu Strat Cour UNI Cybe Fram Secu Proje	alations regy V nter Me T 2 er Secu nework urity Po ect– C Catalo	s – En ersus Po easures $\begin{vmatrix} CYBH \\ CY$	Cyber Security policy – Domain of Cyber Security Policy – Technology Operations – Technology – Cyber Security Evolution – Productivity – Challenges ER SECURITY OBJECTIVES AND GUIDANO etrics – Security Management Goals – Counting ommerce Systems – Industrial Control Systems – ojectives – Guidance for Decision Makers – Tor curity Management – Arriving at Goals – Cyber bach – Catalog Format – Cyber Security Policy Tax ER SECURITY POLICY CATALOG	echnolo – Inter CE g Vuln - Perso ne at th r Secur	ogy C rnet – erabilit nal Mo ne Top rity Do	onfigur E com ties – obile D – Pol ocumen	ration – merce – +3 Security evices – icy as a		
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00.0	0 3	0	$\frac{0}{0}$	0	0	0 2	2	0	0 3
CO 1	0	0	0	0	0	2	0	3	0
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
o. <u>mups:/</u>	www.meny.go	<u>5v.m/com</u>	-	COs vs I	POs				
-	<u>ces-for-employ</u> /www.meity.go		_	or_lowo					
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	professional.mi	<u>it.edu/</u> pro	<u>gram</u> s/s	<u>hort–</u> pro	ograms/a	applied–			
	/www.coursera nptel.ac.in	a.org/spec	<u>ializatio</u>	ons/cybe	r-securi	<u>ty</u>			
E–Referen									
Learnin 3. Rhodes McGra	–Ousley, Marl w–Hill, 2013.	-			-		-	_	-
	Cyber security		•						~~
References									
"Cyber S 2. Rick H 3. Cyber	r L. Bayuk, J. F Security Policy loward "Cyber Laws & Infor January 2019.	Guidebor Security rmation T	ok" Joh Essentia	n Wiley als" Aue	& Sons rbach Pu	2012. ublication	ns 2011.		-
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Lecture	15	Tutoria	al 0		SS	1	5	Total	30
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Social Netw Basic Secu	vorking. Irity for Wind	lows Us	er Acci	ount Pa	ssword	Introduc	tion to	mobile ?	Smartnhon
0	Vi–Fi Security	,Guidelin	es for s	ocial me	edia secu	urity ,Tip	os and be	est practic	es for safe
•	Guidelines for	-	-	-			-		
Guidelines	to choose	web	browsei	rs, Sec	uring	web b	orowser,	Antivir	us, Ema
<u><u> </u></u>	SECURITY	PRACE	ICES						3+3

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4.b. Curriculum and Syllabus of M.Sc Mathematics -After Revision

MASTER OF SCIENCE (TWO YEAR - FULL TIME) REGULATION - 2023

(Applicable to the students admitted from the academic year 2023-2024 onwards)

Semester	Category	CourseCo de	TitleoftheCourse	L	Т	Р	Н	С
	Core	YMA101	LinearAlgebra	4	1	0	5	5
	Core	YMA102	RealAnalysis	4	1	0	5	5
	Core	YMA103	OrdinaryDifferentialEquations	4	1	0	5	5
	Core	YMA104	Graph Theory	4	1	0	5	5
Ι	Elective	YMA1E1	MathematicalStatistics /Fuzzy Sets and their Applications/ AI and Machine Learning	3	1	0	4	4
	Elective	YMA1E2	Computer Programming (C++ Theory and Lab)/Number Theory and Cryptography/Formal Languages and Automata Theory	2/4	0	2/0	4	4
		-	Total	21	5	2	28	28
	Core	YMA201	AdvancedAlgebra	4	1	0	5	5
	Core	YMA202	Complex Analysis	4	1	0	5	5
	Core	YMA203	Partial Differential Equations	4	1	0	5	5
	Core	YMA204	AdvancedNumericalMethods	4	1	0	5	5
Π	Elective	YMA2E1	Resource Management Techniques /Data Science using R programming/ Python for Mathematics	3	1	0	4	4
	Elective	YMA2E2	Data Analysis using SPSS/ NumericalMethodsPracticalusin gMAT Lab/Data Analytics Practical with Python	3/2	1	0/2	4	4
	SEC	YRM001	Research Methodology	2	0	0	2	2
		1	Total	23	5	2	30	30
	Core	YMA301	Topology	4	1	0	5	5
	Core	YMA302	Measure theory and Integration	4	1	0	5	5
	Core	YMA303	Functional Analysis	4	1	0	5	5
III	Core	YMA304	Differential Geometry	4	1	0	5	5

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	NME	YMA305	Core Industry Module: Mathematics for Finance and Insurance	3	1	0	4	4
	Elective	YMA3E1	Fluid Dynamics / Probability Theory / Design and Analysis of Algorithms	3	1	0	4	4
			Total	22	6	0	28	28
IV		YMA401	Project	0	0	0	30	6
			Total	0	0	0	30	6

Total Number of Credits: 92

COU	COURSE NAME LINEAR ALGEBRA		L	Т	Р	С	
COURSE CODE)DE	YMA101	4	1	0	5
С	Р	Α		L	Т	Р	Η
5	0	0		4	1	0	5
PREREC	UISITE		Algebraic Structures				

Objective:

The objective of this course is to develop a strong foundation in linear algebra that provide a basic for advanced studies not only in mathematics but also in other branches like engineering, physics and computers, etc. Particular attention is given to canonical forms of linear transformations, diagonalizations of linear transformations, matrices and determinants.

	COURSE OUTCOMES	DOMAIN	LEVEL
CO 1	Utilize properties of linear transformations to solve problems.	Cognitive	Applying
CO 2	Demonstrate the concept of prime factorization of a given polynomial.	Cognitive	Understanding
CO 3	Utilize the concept of determinant find the adjoint, inverse, and characteristic values.	Cognitive	Applying
CO 4	Compare Simultaneous triangulations, diagonalization and decomposition.	Cognitive	Understanding
CO 5	Demonstrate the Rational and Jordan forms.	Cognitive	Understanding
UNIT 1	Linear transformations		12 + 3
Linear tr	ansformations – The Algebra of Linear Transformation - Iso	morphism of	vector spaces -
Represen	tations of linear transformations by matrices – Linear functional.		
UNIT 2	Algebra of polynomials		12 + 3
Algebras	- The algebra of polynomials -Polynomial ideals - The prime f	actorization o	f a polynomial –
Commuta	ative Rings - Determinant functions.		
UNIT 3	Determinants		12 + 3

Permutations and the Uniqueness of Determinants – Classical adjoint of A (square) matrix – Inverse of an invertible matrix using determinants – Characteristic values – Annihilating polynomials.

UNIT 4 Diagonalization

Invariant subspaces – Simultaneous triangulations – Simultaneous diagonalization – Direct-sum decompositions – Invariant direct sums – Primary decomposition theorem.

UNIT 5 | The Rational and Jordan forms

12 + 3

12 + 3

Cyclic subspaces – Cyclic decompositions theorem (Statement only) – Generalized Cayley – Hamilton theorem - Rational forms – Jordan forms.

LECTURE 60 TUTORIAL 15 P	RACTICAL 0 TOTAL 75
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Text Book:

1. Kenneth M Hoffman and Ray Kunze, Linear Algebra, 2nd Edition, Prentice-Hall of India Pvt. Ltd, New Delhi, 2013.

Unit	Chapter(s)	Sections
Ι	3	3.1 – 3.5
II	4 & 5	4.1, 4.2, 4.4, 4.5 and 5.1, 5.2
III	5&6	5.3, 5.4 and 6.1-6.3
IV	6	6.4 - 6.8
V	7	7.1 - 7.3

References:

1.M.Artin, "Algebra", PrenticeHallofIndiaPvt.Ltd., 2005.

2.S.H.Friedberg, A.J.InselandL.ESpence, "LinearAlgebra", 4thEdition,

Pritice-HallofIndiaPvt.Ltd.,2009.

3.I.N. Herstein, "Topics in Algebra", 2ndEdition, Wiley Eastern Ltd,NewDelhi,2013.

4.J.J. Rotman, "Advanced Modern Algebra", 2ndEdition, Graduate

Studies in Mathematics, Vol. 114, AMS, Providence, Rhode Island, 2010.

5.G.Strang, "IntroductiontoLinearAlgebra", 2ndEdition, PrenticeHallof

IndiaPvt.Ltd,2013.

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- 1. http://asian-university.org/wp-content/uploads/2018/02/Linear-Algebra_Fall18.pdf [Asian women university]
- 2. http://people.math.harvard.edu/~knill/teaching/math21b2010/21b_text.pdf [Harvard University]

COs VS Pos											
PO 1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PS01 PS0											
CO 1	3	3	2	0	1	3	3	3	3	3	0

~~~	2	•	-	0	0	-		•	2		0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	3	2	0	1	3	3	3	3	3	0
CO 4	3	2	1	0	0	2	2	2	3	2	0
CO 5	3	2	1	0	0	2	2	2	3	2	0
TOTAL	15	12	7	0	2	12	12	12	15	12	0
SCALED VALUE	3	3	2	0	1	3	3	3	3	3	0
0 - No Relation, 1 –	Low Re	elation,	2- Med	lium R	elation	, 3- Hig	h Rela	tion			
1-5→1, 6-10→2, 11-	-15→3										

C	ourse Nar	ne	REALANALYSIS	L	Т	Р	С
(	Course Coo	le	YMA102	4	1	0	5
С	Р	Α		L	Т	Р	Н
5	0	0		4	1	0	5
PRERE	QUISITE	Ť	Algebraic Structures			-	
Objectiv	-						
v		se is to v	vork comfortably with functions of bounded varia	tion Rieman	n-Stie	lties	
			infinite series, infinite product and uniform conve				
	various lin			-8		proj	
			of this course, the students will be able to:				
on succ		Piction	in this course, the students will be usic to:				
			DURSE OUTCOMES	DOMAIN		LEVE	T
		U	JURSE OUTCOMES	DOMAIN			
00.1				Q	TT	1 4	1.
CO 1	-		aluate functions of bounded variation and	Cognitive	Ur	ndersta	naing
	Rectifiab						
CO 2	Demons	trate the	concept of Riemann-Stieltjes integral and its	Cognitive	Ur	ndersta	nding
	propertie	s.					
CO 3	Demons	t <b>rate</b> the	e concept of step function, upper function,	Cognitive	Ur	ndersta	nding
	Lebesgue	e functior	and their integrals.				
CO 4	_		s mathematical proofs using the properties of	Camiting		A	
CO 4			s and establish the Levi monotone convergence	Cognitive		Applyi	ing
	theorem.	U	č				
CO 5	Demons	trate the	concept and properties of inner products, norms	Cognitive	Ur	ndersta	nding
	and meas			C			U
UNIT I	Functio	nsofbou	Indedvariation			-	12 + 3
			of monotonic functions - Functions of bounded	ed variation -	Tota		
		-	al variation - Total variation on [a, x] as a fun				
			sed as the difference of two increasing function				
	d variatior		č				
Infinite	Series: A	Absolute	and conditional convergence - Dirichlet's te	st and Abel'	s test	-	
			Riemann's theorem on conditionally converg				
UNIT 2	ī		tieltjes Integral			-	12 + 3
Introduc	tion-Notati	on-Thede	efinitionoftheRiemann-Stieltjesintegral-LinearPro	perties-Integr	ation	by	parts-
Change	of var	iable i	n a Riemann - Stieltjes integral -	Reductiontoal	Riema	annInte	gral–
Euler'ss	ummationf	ormula-N	Ionotonicallyincreasingintegrators, Upperandlowe	erintegrals-			
Additive	andlinearit	yproperti	esofupper, lower integrals-Riemann's				
condi	tion -Comp	arisonthe	eorems.				
UNIT 3	The Rie	nann - S	tieltjes Integral			1	12 + 3
Integrate	ors of bou	nded var	riation-Sufficient conditions for the existence	of Riemann-	Stieltj	jes inte	egrals
Necessa	ry conditio	ns for the	e existence of RS integrals- Mean value theorem	s - integrals a	s a fu	nction	of the
interval	- Second	fundame	ental theorem of integral calculus-Change of	variable -Sec	cond	Mean	Valu
Theorem		Riemann	e	pending on	a	para	meter
	tiationunde	rintagral	sign-Lebesguecriterionforexistenceof Riemannin	teorals			
	1	<b>č</b>	linfiniteProducts	tegrais.			

Double sequences - Double series - Rearrangement theorem for double series - A sufficient condition for equality of iterated series - Multiplication of series - Cesaro summability - Infinite products. **Power series** - Multiplication of power series - The Taylor's series generated by a function - Bernstein's theorem - Abel's limit theorem - Tauber's theorem.

## UNIT 5 Sequences of Functions

12 + 3

Pointwise convergence of sequences of functions - Examples of sequences of real - valued functions -Uniform convergence and continuity - Cauchy condition for uniform convergence - Uniform convergence of infinite series of functions - Riemann - Stieltjes integration – Non-uniform Convergence and Term-by-term Integration - Uniform convergence and differentiation - Sufficient condition for uniform convergence of a series - Mean convergence.

	0						
LECTURE	60	TUTORIAL	15	PRACTICAL	0	TOTAL	75

## **Text Book:**

TomM.Apostol:*MathematicalAnalysis*,2ndEdition,Addison-WesleyPublishingCompanyInc. NewYork, 1974.

Unit	Chapter	Sections	
т	6	Sections6.1 to 6.8	
I	8	Sections8.8, 8.15, 8.17, 8.18	
II	7	Sections7.1 to 7.14	
III	7	Sections7.15 to 7.26	
117	8	Sections8.20, 8.21 to 8.26	
IV	9	Sections9.149.15, 9.19, 9.20	
V	9	Sections9.1to 9.6,9.8,9.9,9.10,9.11,9.13	

## **References:**

1. Walter Rudin, Principles of Mathematical Analysis, Tata McGraw Hill, New York, 1988.

- 2. G. de Barra, Measure Theory and Integration, Wiley Eastern Ltd., New Delhi 1981.
- 3. Tom M. Apostol, Mathematical Analysis, Narosa Publishing House, New Delhi, 1997.
- 4. H. L. Royden, Real Analysis, Third Edition, Macmillan Publishing Company, New Delhi, 1988.
- 5. Inder K. Rana, An Introduction to Measure and Integration, 2nd Edition, Narosa Publishing House, 2015.
- 6. Gelbaum, B. R. and J. Olmsted, Counter Examples in Analysis, Holden day, San Francisco, 1964.
- 7. Burkill. J. C, The Lebesgue Integral, Cambridge University Press, 1951.
- 8. Munroe. M. E, Measure and Integration, Addison- Wesley, Mass, 1971.

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- 2. http://ocw.mit.edu/ocwweb/Mathematics,
- 3. http://www.opensource.org,
- 4. www.mathpages.com

				CO	s VS PO	Os					
	<b>PO 1</b>	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PSO1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	2	1	0	0	2	2	2	3	2	0
CO 4	3	3	2	0	1	3	3	3	3	3	0
CO 5	3	2	1	0	0	2	2	2	3	2	0
TOTAL	15	10	6	0	1	11	11	11	15	11	0
SCALED VALUE	3	2	2	0	1	3	3	3	3	3	0
0 No Polation 1	L arra Da	lation /		De		) II:~h	Dalat				

# 0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation

C	ourse Nai	ne	ORDINARY DIFFERENTIAL	L	Т	Р	С
ſ		J.,	EQUATIONS VMA 102		1	0	
C	Course Co P	A A	YMA103	4 L	1 T	0 P	5 H
5	0	0 0		4	1	0	5
-	QUISITE		UG level Calculus and Differential Equations	-	-	U	
Objectiv To deve	v <b>e:</b> elop a stro	ong back	ground on finding solutions to linear differ efficients and also with regular singular poi	-	ations	s with	
•			f this course, the students will be able to:				
		CC	DURSE OUTCOMES	DOMAI	N	LEVI	EL
CO 1	-	the qua ial Equati	litative behavior of solutions of systems of ons.	Cognitive	e l	Understa	nding
CO 2		ne physica amical sys	al phenomena modeled by differential equations stems.	Cognitive	e ]	Rememb	ering
CO 3	Analyze coefficie		lutions of linear equations with variable	Cognitive	e	Analyz	ving
CO 4	Formula	ate Green	's function for boundary value problems.	Cognitive	e	Creati	ng
CO 5		ne First ve approx	order linear equations by using method of imations.	Cognitive	e	Apply	ing
UNIT I			with constant coefficients				2 + 3
			us equations-Initial value problems-Linear de for Wronskian- Non-homogeneous equation			ndepend	lence-
			with constant coefficients				2 + 3
			omogeneous equation of order n –Initial				nilator
			ogeneous equation- Algebra of constant coeff	ficient oper	rators		<u></u>
UNIT 3		-	withvariablecoefficients ence and uniqueness theorems – Solutions to sol	va a non ha	moge		$\frac{2+3}{1}$
– Wrons	kian and l	inear dep	endence – Reduction of the order of a homogen cients-The Legendre equation.		-		-
			n with regular singular points			1	2 + 3
		-	er equations with regular singular points –Except	ional cases	– Bess		
	T		niqueness of solutions to first order equation				2 + 3

Equation with variable separated – Exact equation – Methodof successive approximations – the Lipschitz condition – Convergence of the Successive approximations and the existence theorem.

LECTURE	60	TUTORIAL	15	PRACTICAL	0	TOTAL	75

## **Text Book:**

1. E.A. Coddington, *An introduction to ordinary differential equations* (3rd Printing) Prentice-Hall of India Ltd., New Delhi, 1987.

Unit	Chapter	Sections
Ι	2	Sections 1 to 6
II	2	Sections 7 to 12.
III	3	Sections 1 to 8
IV	4	Sections 1 to 4 and 6 to 8
V	5	Sections 1 to 6

### **References:**

- 1. WilliamsE.BoyceandRichardC.DIPrima,*Elementarydifferentialequationsandbounda* ry valueproblems, JohnWileyandsons,NewYork, 1967.
- 2. GeorgeFSimmons, *Differentialequationswithapplications and historical notes*, TataMcGrawHill, NewDelhi, 1974.
- 3. N.N.Lebedev, *Special functions and their applications*, Prentice Hallof India, New Delhi, 1965.
- 4. W.T.Reid. Ordinary Differential Equations, John Wileyand Sons, New York, 1971
- 5. M.D. Raisinghania, *AdvancedDifferentialEquations*, S. Chand&CompanyLtd.NewDelhi 2001
- 6. B. Rai, D. P. ChoudaryandH.I.Freedman, *ACourseinOrdinaryDifferentialEquations*, Narosa PublishingHouse, NewDelhi, 2002.

- 1. http://mathforum.org,
- 2. http://ocw.mit.edu/ocwweb/Mathematics,
- 3. http://www.opensource.org,
- 4. www.mathpages.com

				CO	s VS PO	Os					
	PO 1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PSO1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	2	1	0	0	0	1	1	1	2	1	0
CO 3	3	3	3	1	2	3	3	3	3	3	1

CO 4	3	3	3	3	3	3	3	3	3	3	3
	5	5	5	5	5	5	5	5	5	5	5
CO 5	3	3	2	0	1	3	3	3	3	3	0
TOTAL	14	12	9	4	6	12	12	12	14	12	4
SCALED VALUE	3	3	2	1	2	3	3	3	3	3	1
0 - No Relation, 1 –	Low Re	lation, 2	2- Medi	ium Re	lation, 3	3- High	Relatio	n	L	L	L

C	ourse Nan	ne	<b>GRAPH THEORY</b>	$\mathbf{L}$	Т	Р	С
C	Course Coo	le	YMA104	4	1	0	5
С	Р	Α		L	Т	Р	Н
5	0	0		4	1	0	5
PRERE	QUISITE		Concept of relation, mapping, Discrete Structure	s			

# **Objective:**

To develop a strong background on finding solutions to linear differential equations with constant and variable coefficients and also with regular singular points.

# On successful completion of this course, the students will be able to:

	COURSE OUTCOMES	DOMAIN	LEVEL
CO 1	<b>Demonstrate</b> to state that basic definitions and relevant theorems.	Cognitive	Understanding
CO 2	<b>Construct</b> graph theoretic models for real life problems.	Cognitive	Applying
CO 3	Analyze graphs satisfying certain properties.	Cognitive	Analyzing
CO 4	<b>Apply</b> core theoretical knowledge of graph theory to solve problems.	Cognitive	Applying
CO 5	<b>Demonstrate</b> the significance of planar graphs.	Cognitive	Understanding
UNIT I	Graphs, sub graphs and Trees		12 + 3
Graphsar	ndsimplegraphs-Graphisomorphism-Theincidenceandadjacencymatr	ices–Subgraph	s-Vertex
Degrees -	- Paths and Connection - Cycles - Trees - Cut edges and Bonds- Cu	tvertices – Cay	ley'sFormula.
UNIT 2	Connectivity, Euler Toursand Hamilton Cycles		12 + 3

UNIT 3		gs,EdgeColo	hvatal'sTheorem					12 + 3
				overings	in Bipartite C	- Franks	- Hall's T	Theorem
					- Edge Chromatic			
			<b>Cliques</b> , Vertex				U	12 + 3
Independ	ent Sets	–Gallai'sT	heorem-Ramsev	'sTheorer	n–Ramsey'sgraph	-Erdos's	Theorem -	-Chromat
1			s Theorem –Haj					
			5	5				
UNIT 5	PlanarGr	raphs						12 + 3
Planean	dPlanarGra	phs–PlanarEn	nbeddingofagrap	h-Stereo	graphicProjection	-DualGra	aphs-	
-	1 0	1	1		Formula–Bridges–	Thetrans	ferofabridge	-
	ski'sTheor	em. Thefive-o	colortheoremand	thefour-co	olorconjecture			
	FURE ok:	60	TUTORIAL	15	PRACTICAL	0	TOTAL	75
Text Boo	k:				PRACTICAL			
Text Boo	k:							
Text Boo	<b>k:</b> raph Theor	y with Applic	ations, J. A. Bor	ndy and U				
Text Boo	k: raph Theor Unit	y with Applic Chapter 1 2	ations, J. A. Bor	ndy and U				
Text Boo	k: raph Theor Unit	y with Applic Chapter 1	ations, J. A. Bor Sections Sec: 1.1 - 1.7	ndy and U				
Text Boo	ok: raph Theor Unit 1 2	y with Applic Chapter 1 2 3 4	ations, J. A. Bor Sections Sec: 1.1 - 1.7 Sec: 2.1 - 2.4 Sec: 3.1 - 3.2 Sec: 4.1 - 4.2	ndy and U				
Text Boo	sk: raph Theor Unit 1	y with Applic Chapter 1 2 3 4 5	ations, J. A. Bor Sections Sec: 1.1 - 1.7 Sec: 2.1 - 2.4 Sec: 3.1 - 3.2 Sec: 4.1 - 4.2 Sec: 5.1 - 5.3	ndy and U				
Text Boo	sk: raph Theor Unit 1 2 3	y with Applic Chapter 1 2 3 4 5 6	ations, J. A. Bor Sections Sec: 1.1 - 1.7 Sec: 2.1 - 2.4 Sec: 3.1 - 3.2 Sec: 4.1 - 4.2 Sec: 5.1 - 5.3 Sec: 6.1 - 6.2	ndy and U				
Text Boo	ok: raph Theor Unit 1 2	y with Applic Chapter 1 2 3 4 5 6 7	ations, J. A. Bor Sections Sec: 1.1 - 1.7 Sec: 2.1 - 2.4 Sec: 3.1 - 3.2 Sec: 4.1 - 4.2 Sec: 5.1 - 5.3 Sec: 6.1 - 6.2 Sec: 7.1 - 7.2	ndy and U				
Text Boo	sk: raph Theor Unit 1 2 3	y with Applic Chapter 1 2 3 4 5 6	ations, J. A. Bor Sections Sec: 1.1 - 1.7 Sec: 2.1 - 2.4 Sec: 3.1 - 3.2 Sec: 4.1 - 4.2 Sec: 5.1 - 5.3 Sec: 6.1 - 6.2	ndy and U				

- 2. D.B. West, Introduction to Graph Theory, II Ed., PHI, New Delhi, 2007.
- 3. J. Clark and D.A. Holton, A First look at Graph Theory, Allied Publishers, New Delhi, 1995.
- 4. F. Harary, Graph Theory, Addison Wesley, Reading Mass, 1969.
- 5. Graham R.L., Rothschild B.L and Spencer J.H., "Ramsey Theory", Wiley Publishers, Second Edition, 1990.
- **6.** Biggs N., "Algebraic Graph Theory", Cambridge Tracts in Mathematics 67, Cambridge University Press, 1994. MX8003 Algebraic Theory of Semigroups.

- 1. <u>https://www.zib.de/groetschel/teaching/WS1314/BondyMurtyGTWA.pdf</u>
- 2. https://en.wikipedia.org/wiki/Graph theory
- 3. <u>http://tezu.ernet.in/dmaths/programme/m.sc.syllabus-2019.pdf</u>[OxfordUniversity]

4. <u>https://www-wp.maths.cam.ac.uk/documents/schedules.pdf/</u>[CambridgeUniversity

5. GraphTheoryANPTELCoursebyS.A.Choudum,DepartmentofMathematicsIITMadras Chennai,Indiahttps://nptel.ac.in/courses/111/106/111106050/

COs VS POs													
	PO 1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PSO1	PSO2		
CO 1	3	2	1	0	0	2	2	2	3	2	0		
CO 2	3	3	2	0	1	3	3	3	3	3	0		
CO 3	3	3	3	1	2	3	3	3	3	3	1		
CO 4	3	3	2	0	1	3	3	3	3	3	0		
CO 5	3	2	1	0	0	2	2	2	3	2	0		
TOTAL	15	13	9	1	4	13	13	13	15	13	1		
SCALED VALUE	3	3	2	1	1	3	3	3	3	3	1		
0 - No Relation, 1 –	Low Re	lation, 2	2- Medi	ium Re	lation,	3- High	Relatio	)n	1	1	1		

 $1\textbf{-}5 {\rightarrow} 1, 6\textbf{-}10 {\rightarrow} 2, 11\textbf{-}15 {\rightarrow} 3$ 

C	ourse Nan	ne	MATHEMATICAL STATISTICS	L	Т	Р	С
	ourse Cod		YMA1E1A	3	1	0	4
C 4	<u>Р</u> 0	A 0		L 3	<u>T</u>	P 0	H 4
-	UISITE	U		3	1	U	4
Objectiv	-						
On succe	essful com	pletion of	this course, the students will be able to:				
		CO	URSE OUTCOMES	DOMAI	N	LEV	EL
CO 1	<b>Demonst</b> Distribut		owledgeofprobabilityandstatistical	Cognitiv	e	Underst	anding
CO 2	Solvethe variouspa		babilitydistributionsoftransformedvariablesand singspecialdistributions.	Cognitiv	e	Appl	ying
CO 3	Examine	etransform	ationsofvariables using special distributions.	Cognitiv	e	Analy	zing
CO 4	Elaborat	tetheconce	ptsofprobabilityinmultivariable distribution.	Cognitiv	e	Crea	ting
CO 5	Estimate	probabilit	yvalueusingcentrallimittheorem.	Cognitiv	e	Evalu	ating
UNIT I			istributions				9+3
-	· · · · ·		n – Randomvariables–Distributionfunction–M		alexpe	ctation-	-Special
	-	riateDistri	ecialmathematicalexpectations–Chebyshev'sine	quanty.			9+3
Distribut	ionsoftwol entRandor	Randomva	riables–Conditionaldistributionsandexpectations –SomespecialDistributions:TheBinomialandrela		tions-	- The	Poisson
UNIT 3		-	tributions				9+ 3
		-	uare distributions – The Normal distributions –				
			ndomVariables:Samplingtheory–Transformation	ns of varia	bles	of the	discrete
			blesofthecontinuoustype.				0.
UNIT 4	Distribu	uonsoiru	nctionsof Kandom v ariables				9+ 3
The Beta	, t and F d	istribution	s, - Distributions of order statistics – The mome	nt generatir	ng fun	ction te	chnique
– the dist	ributions o	of $x$ and $n$ $S$	$5^2$ - Expectations of functions of Random variab	oles.			

UNIT 5	Limiting 1	Distribution	IS					9+3
			onvergence inProl remonlimitingdis		- Limiting moment	generation	n functions – T	he
LECT	URE	45	TUTORIAL	15	PRACTICAL	0	TOTAL	60
Text Bool	κ:							

1. Introduction to Mathematical Statistics (Fifth Edition) by Robert V. Hogg, Allen T. Craig.,

Unit	Chapter(s)	Section(s)	Page (s)
1	1	1.3, 1.5, 1.7, 1.8, 1.9, 1.10	12-17, 28-35, 44-50, 52-56, 57-64, 68-70
2	2	2.1, 2.2, 3.1, 3.2	74-81, 82-90,
	3		116-124, 126-129
3	3	3.3, 3.4, 4.1, 4.2, 4.3	131-136, 138-144, 146-150,
	4		155-178
4	4	4.4, 4.7, 4.8, 4.9	179-184, 193-200, 203-220.
5	5	5.1, 5.3, 5.4, 5.5	233-255.

### **References:**

- 1. M. Fisz, Probability theory and Mathematical Statistics, John Wiley & Sons, New York, 1963.
- 2. E.J. Dudewiczn and S.N. Mishra, Modern Mathematical Statistics, John Wiley & Sons, New York, 1988.
- 3. V.N. Rohatgi, An introduction to Probability theory and Mathematical Statistics, Wiley Eastern Limited, New Delhi, 1988.

## Website and e-Learning Source

### 1.<u>https://nptel.ac.in/courses/111/105/111105124/</u> 2.<u>https://nptel.ac.in/courses/111/102/111102134</u>

COs VS Pos													
	PO 1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PSO1	PSO2		
CO 1	3	2	1	0	0	2	2	2	3	2	0		
CO 2	3	3	2	0	1	3	3	3	3	3	0		
CO 3	3	3	3	1	2	3	3	3	3	3	1		
CO 4	3	3	3	3	3	3	3	3	3	3	3		
CO 5	3	3	3	2	3	3	3	3	3	3	2		
TOTAL	15	14	12	6	9	14	14	14	15	14	6		

SCALE	D VALUE 3	3	3	2	2	3	3	3	3		3	2
) - No R	elation, 1 – Low R	elation, 2-	Mediu	m Rela	ation, 3	- High	Relatio	)n				
	,	,										
l-5→1,	6-10→2, 11-15→3											
C	ourse Name		FUZZ	Y SET	'S ANI	) THE	IR		L	Т	Р	C
			A		CATIC						Г	C
	Course Code			YM	A1E1E				3	1		4
<u>C</u> 4	P         A           0         0								L 3	T 1	P 0	H 4
-	QUISITE	Basickn	owledg	einset	theory	&Anal	vsis		3	1	U	-
Objectiv		Dusteini	onicag	ember	encory	<u>williui</u>	y 515					
•	nobjectivesofthisco	urseareto:										
1. To	ounderstandthebasic	knowledge	offuzzy	setthe	ory.							
2. To	ogainknowledgeinfu	zzyrelation	sandfuz	zzymea	asures.							
3. To	blearnthebasicsofpat	ternrecogn	itionand	ldecisi	onmak	ing.						
4. To	learnaboutrelations	betweencri	spandfu	ızzyina	pplicat	ions.						
On succ	essful completion o	of this cour	se, the	stude	nts will	be abl	e to:					
	C(	OURSE OU	TTCON	AFS					OMAI	N	LEV	FT
		JUNSE OU		ILS					UMAII			
CO 1	<b>Demonstrate</b> the	e basic id	eas of	fuzzy	sets,	operat	ions an	d c	lognitiv		Understa	unding
	properties of fuzz			-		-			Cognitive	e		Ĺ
	1 1	, 			5							
CO 2	Demonstrate Star	ndard fuzzy	operat	ions.				C	Cognitive	e	Understa	anding
CO 3	Compare Crisp as	nd fuzzy re	lations.					0	Cognitive	e	Understa	anding
					•							
	<b>Compare</b> random	and non-r	andom	uncert	ainty, a	ind the	dec1s101	¹⁻ 0	Cognitive	e	Understa	anding
CO 4	1.	· <b>F</b>										
CO 4	making processes	in Fuzzy e		nent.								
			nvironn		differe	nt field	<u> </u>	(	Cognitive	e '	Understa	anding
	making processesDemonstrate the		nvironn		differe	nt field	s.	0	Cognitive	e	Understa	anding
CO 4 CO 5 UNIT I	<b>Demonstrate</b> the	application	nvironn		differe	nt field	8.	0	Cognitive	e	Understa	
CO 5 UNIT I		application	nvironn Is of Fu	zzy in								9+3
CO 5 UNIT I Overviev	Demonstrate the Crispsetsandfur w of Classical Sets, rt – Level sets, fuzzy	application zzysets Membersh y points, α-	nvironn is of Fu ip Func	zzy in	leight o	of a fuz	zy set –	Norm	al and s	ub no		9+3
CO 5 UNIT I Overviev - Suppo UNIT 2	Demonstrate the Crispsetsandfu w of Classical Sets, rt – Level sets, fuzzy	application zzysets Membersh y points, α- izzy sets	nvironn is of Fu ip Func -cuts – l	zzy in tion, H Decom	leight o	of a fuz n Theo	zy set – rems, E	Norm	al and s	ub no iple.	rmal fuz	9 + 3 zzy se 9 + 3

of fuzzy op								
UNIT 3	<b>_</b>				• • •	6.0.	1.5	9+3
					ions and properties			
<u> </u>		<u> </u>			ions of fuzzy opera	tions - 0	Generalizations	s - Non
	• • • • • • • • • • • • • • • • • • •		ind equivalence		,			0.2
		_	uzzyEnvironm					9 + 3
General Di	scussion	– Individual	Decision making	g – Mult	i person decision m	naking –	Multi criteria	decision
making – N	Aulti stag	e decision ma	king – Fuzzy rai	nking me	thods – Fuzzy linea	r progran	nming.	
I								<del></del>
UNIT 5	Applicat	ions						9 + 3
Medicine	- Econon	nics – Fuzzy	Systems and Ger	netic Alg	orithms – Fuzzy Re	gression	– Interpersonal	
		Other Applica		Ŭ			•	
LECT	URE	45	TUTORIAL	15	PRACTICAL	0	TOTAL	60
Text Book	•		· · · · ·		· ·			
1. Geo	orge J. Kl	ir and Bo Yua	an, Fuzzy sets an	d Fuzzy	Logic Theory and A	Applicatio	ons, PHI Leanii	ng
Priv	vate Limit	ted, New Dell	ni (2009).					
Reference	s:							
1.	A. K. B	hargava; Fuz	zy Set Theo	ry,	Fuzzy Logic and	their		
	Applica	tions, publish	ed by S. Chand	Pvt. Lim	ited (2013).			
2.	K. Punc	lir and R. Pur	dir, Fuzzy sets a	nd their	application, Publish	ed by A l	Pragati	
	edition					,	C	
3.	H. J. Zi	mmermann. F	Fuzzy set theory	and its a	oplications, Springer	r (2012).		
		<b>, -</b>	j~j	······································	r	()		
Website a	nd e-Lear	rning Source	: NPTEL					

COs VS POs													
	PO 1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PSO1	PSO2		
CO 1	3	2	1	0	0	2	2	2	3	2	0		
CO 2	3	2	1	0	0	2	2	2	3	2	0		
CO 3	3	2	1	0	0	2	2	2	3	2	0		
CO 4	3	2	1	0	0	2	2	2	3	2	0		
CO 5	3	2	1	0	0	2	2	2	3	2	0		
TOTAL	15	10	5	0	0	10	10	10	15	10	0		

SCALE	D VALUE	3	2	1	0	0	2	2	2	3		2	0
0 - No R	Relation, 1 – 2	Low Re	lation, 2	2- Medi	ium Re	lation, 3	- 3- High	Relatio	)n				
1-5→1,	6-10→2, 11-	15→3											
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	N N.T									-			0
-	Course Name Course Code		4	AI ANL	-	HINE I IA1E1(	LEARN	ING		L 3	Т 1	P 0	C 4
C	P	Α					0			L	T	P	H
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PRERE Objectiv	QUISITE												
	vc.												
On succ	essful comp	letion of	this co	urse, th	ne stud	ents wil	l be abl	e to:					
		<u> </u>			MEG								DT.
		CO	UKSE	OUTCO	JMES				DC	MAIN		LEV	EL
CO 1	Overview	of AI.							Co	gnitive	U	ndersta	andin
CO 2	Categorize calculus.	knowle	dge usii	ng prop	ositiona	al calcu	lus and	predica	te Co	gnitive		Analy	zing
CO 3	Explain the	e founda	tions of	Learnir	ng mod	els.			Co	gnitive	U	ndersta	anding
<b>CO 4</b>	Construct discriminat			sion M	odels	and Pro	obabilist	ic	Co	gnitive		Apply	ving
CO 5	Determine	ensemb	le Learr	ing and	unsup	ervised	learning	•	Co	gnitive		Evalua	ting
	INTRODU										I		9+3
	Issues and				-					<b>.</b> .			
	ons Problem strategies; fo												
	LOGIC IN						Ite sea			<u>t Dicua</u>		<u>t souror</u>	<u>9 + (</u>
	and Semanti												
Modus Refutation	Ponens-Infer	rence R	ules; A	Applyin	g Reso	olution:	Norma	al Forn	n Conv	ersion-	Reaso	ning t	hroug
	FOUNDA	TIONS	OF LE	ARNIN	G								9+3
	ents of learn					netric n	nodels -	- Pproba	abilistic	models	- Log	gical m	
	g and gradi												
	ement – The												
	of generaliz		genera	inzation	bound	ı – Apj	proxima	uion ge	eneraliza	uon tra	ide of	ur – b1	as ar
	<b>SUPERVI</b>		CARNI	NG									9+3
												1	

Linear Regression N	Aodels: Least	squares, single	& multir	le variables, Baye	esian linea	r regression,	Gradient
descent, Linear Cl			-	•		-	
discriminative mode							
classifier – Support	vector machin	e, Decision Tre	e, Randon	n Forests			U
UNIT 5 ENSEME	BLE TECHN	IQUES AND U	NSUPER	VISED LEARNI	NG		9+3
Combining multiple	learners: Mo	del combination	schemes	Voting Ensembl	le Learnin	o - hagging h	poosting
stacking; Unsupervi							
Expectation maximiz	-	it mound, moto			, Ouussia		ueis una
LECTURE	45	TUTORIAL	15	PRACTICAL	0	TOTAL	60
		TOTORINE	15	IMICITCIL	U	TOTAL	00
Text Book:							
<b>1.</b> Stephen Mar	sland, —Macl	nine Learning –	An Algor	ithmic Perspective	ell, Second	Edition, Chap	oman
and Hall/CR	C Machine Le	arning and Patte	ern Recog	nition Series, 2014	1.		
References:			. 11*		1 5		
		vig, Artificial li	ntelligenc	e: A Modern Appr	oach, Prer	ntice-Hall, Thi	rd
Edition (2009	9)						
2. Aurélien Gér	on - Hands-O	n Machine Lear	ming with	Scikit-Learn, Ker	as, and Te	nsorFlow, 2nd	ł
Edition. Sept	ember 2019, I	Reilly Media, In	c., ISBN:	9781492032649.			
3. Shai Shalev-	Shwartz and S	hai Ben-David,	" Underst	anding Machine L	earning: F	From Theory to	С
		Iniversity Press		C	U	5	
Webelle and a Tara	-	-					

Website and e-Learning Source; https://nptel.ac.in

COs VS POs													
	PO 1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PSO1	PSO2		
CO 1	3	2	1	0	0	2	2	2	3	2	0		
CO 2	3	3	3	1	2	3	3	3	3	3	1		
CO 3	3	2	1	0	0	2	2	2	3	2	0		
CO 4	3	3	2	0	1	3	3	3	3	3	0		
CO 5	3	3	3	2	3	3	3	3	3	3	2		
TOTAL	15	13	10	3	6	13	13	13	15	13	3		
SCALED VALUE	3	3	2	1	2	3	3	3	3	3	1		

 $1 - 5 \rightarrow 1, 6 - 10 \rightarrow 2, 11 - 15 \rightarrow 3$ 

C	Course Nar	ne	COMPUTER PROGRAMMING (C++ Theory and Lab)	L	Т	Р	C		
(	Course Co	de	YMA1E2A	3	1	0	4		
С	P	A	INAIL/A		T	P	H		
4	0	0		3	1	0	4		
PRERE	QUISITE	-	BasicknowledgefromCLanguage	- C	-	Ū	•		
Objectiv	-								
		mmingsl	killsinC++anditsobject-orientedconcepts.						
			DURSE OUTCOMES	DOMAI	N	LEVEL			
CO 1	Explain	C++ prog	gramming fundamentals.	Cognitiv	re L	Jndersta	unding		
CO 2	Apply st	ructure a	nd union for various functions.	Cognitiv	'e	Apply	ving		
CO 3	Explain	the conce	ept of objects and constructors.	Cognitiv	re L	Jndersta	unding		
CO 4	Explain Destruc rsions.		peratorOverloadingandTypesConve	Cognitiv	re l	Jndersta	anding		
CO 5			g Classes and Pointers, Virtual Functions and	Cognitiv	re l	Jndersta	unding		
UNIT I	Beginni	ng with C	C++ & Tokens, Expressions and Control Struct	ures		9+3			
	tions of C	++- A s	imple C++ Program- An Example with Clas	s- Structur	re of C				
Creating	the Source	e File– Co	ompiling and Linking–Introduction– Token and K	Keyword.					
Introduc Functior C Struct Class–	tion– the l n– Defaults tures Revis	Main Fur Argumer sited– Sp n Outsid	+andclasses action– Function Prototyping– Call by Reference ants– const Arguments– Function Overloading– ecifying a Class– Defining Membership Fun- e Function Inline– Nesting of Member Functio	Friend and actions- A	d Virtu C++ I	ial Fun Program	ctions- witl		
~	Objects,		etors				9 + 3		
Introduc Objects- Functior	tion—— Me - Objects ns— Pointer	emory Al as Func rs of Me	location for Objects– Static Data Member– Static ction Arguments– Friendly Functions– Return embers– Local Classes– Constructors– Parame structors with Default Arguments.	ning Obje	onst. N	rays o Iembe			
			OperatorOverloadingandTypesConversion	ons			9+3		
			tialization of Objects- Copy Constructor- Dynam			~			

Two – Dimensional Arrays – constant Objects– Destructors – Introduction – Defining Operator Overloading – Overloading Unary Operators – Overloading Binary Operators – Overloading Binary Operators Using Friends– Manipulation of Strings Using Operators– Rules for Overloading Operators– Type Conversions.

## UNIT 5Inheritance: Extending Classes and Pointers, Virtual Functions and Polymorphism9

9+3

Introduction–Defining Derived Classes– Single Inheritance–Making a Private Member Inheritance–Making a Private Member Inheritable– Multilevel Inheritance–Multiple Inheritance–Hierarchical Inheritance– Hybrid Inheritance–Virtual Base Classes–Abstract Classes– Constructors in Derived Classes– Member Classes: Nesting of Classes–Introduction– Pointers to Objects–this Pointer–Pointers to Derived Classes– Virtual Functions– Pure Virtual Functions.

LECTURE	45	TUTORIAL	15	PRACTICAL	0	TOTAL	60

### **Text Book:**

1. E.Balagurusamy, Object Oriented Programming with C++, 4th Edition, The McGraw–Hill Company Ltd, New Delhi, 2008.

### **References:**

- 1. V. Ravichandran, Programming with C++, Second Edition Tata McGraw Hill, New Delhi, 2006.
- 2. H. Schildt, The complete Reference of C++, Tata–McGraw–Hill publishing Company Ltd. New Delhi, 2003.
- 3. S.B. Lipman and J.Lafer, C++ Primer, Addition Wesley, Mass., 1998.
- 4. Ashok N.Kamthane, Object Oriented Programming with ANSI and TURBO C++, Pearson Education(P) Ltd, 2003.
- 5. BjarmeStroustrup, The C++ Programming Language, AT & T Labs, Murray Hills, NewJersey, 1998.

Website and e-Learning Source: https://nptel.ac.in

				CO	s VS PO	Os					
	PO 1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PSO1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	3	3	2	0	1	3	3	3	3	3	0
CO 3	3	2	1	0	0	2	2	2	3	2	0
CO 4	3	2	1	0	0	2	2	2	3	2	0
CO 5	3	2	1	0	0	2	2	2	3	2	0
TOTAL	15	11	6	0	1	11	11	11	15	11	0
SCALED VALUE	3	3	2	0	1	3	3	3	3	3	0

0 - No R	elation, 1 – Lov	w Re	lation, 2	2- Med	ium Re	elation,	3- High	Relati	on	I	1	I	
1-5→1, (	6-10→2, 11-15-	→3											
С	ourse Name				MBER CRYP		RY AN APHY	D		L	Т	Р	C
С	Course Code				YN	AA1E2	B			3	1	0	4
C		A								L	T	P	H
$\frac{4}{00000000000000000000000000000000000$		0	Deste	11	- 1 <b>f</b> .					3	1	0	4
PRERE Objectiv	QUISITE		Basic	know	ledgetr	omCL	anguag	ge					
	rovide techniq	ues f	or keer	ing in	format	ion sec	ret						
	npart some tec							on has i	not be	en tam	pered	with	
	xplain fundam												
	1		URSE (	1 0	1 7		11			DOMAI		LEV	EL
CO 1	Apply the c	oncep	ot and	proper	ties of	modu	lar arith	metic	in	Cognitiv	ve.	Apply	ving
	various algori	thms	to find	the solu	ition.					coginav	C	1 1 1 1 1 1	-11 <u>5</u>
	Analara tha		anta of		. 1				a d				
CO 2	Analyze the		-	-	с кеу с	cryptog	rapny,	KSA a	na	Cognitiv	'e	Analy	zing
	Elliptic curve	crypt	ography	/.									
CO 3	Demonstrate	the c	oncepts	of Pse	udo prij	nes				Cognitiv	'e	Understa	anding
		une e	oncepts	01150	uuo piii								
CO 4	Utilize basic	pro	perties	of fin	ite fiel	ds for	factori	ng		Cognitiv	'e	Apply	ving
	polynomials o							0		C			U
CO 5	Utilize Pollaro				olving	the ellip	otic curv	e discre	ete	Cognitiv		Apply	vina
05	logarithm prol				U	1				Cogiiitiv	C	дрргу	mg
UNIT I			D :		D	. 1			-			•	<b>9</b> +
	mple Cryptosys	stems	: Basic	notioi	ns - D	igraph	transfor	mation	– En	cipherin	g Mat	rices –	Line
algebra n	Public Key												0
	Public Key Cryp	togra	phy: Cl	accion	vorene	public l		thantia	otion	Uach fr	unctio	- Kov	9 +
	e – Probabilistic	<u> </u>			-	L	•						SSOV-
<u> </u>	ryptosystem – E		• •			<u> </u>				exenting	e syste	/111 1 <b>/1</b> 4	.55 <b>C</b> y
	Primality					8	8						9+
	rimes: Definitio	ons ar	nd Prop	ositions	s – The	rho me	thod.						
UNIT 4	Factoring		-										9+
	actorization and	lfacto	or bases	- Facto	or base	algorith	ım – He	uristic t	ime e	stimate –	- Conti	nued Fr	action
	- Continued frac												
	Commerce inter												

Basic Facts - Elliptic curve Cryptosystems: Discrete Log on E – Analog of Diffle-Hellman key exchange – Analog of Massey- Omura – Analog of EL Gamel cryptosystems - Elliptic curve factorization: Pollard's p-1 method.

LECTURE	45	TUTORIAL	15	PRACTICAL	0	TOTAL	60	

### **Text Book:**

1. N. Koblitz, "A Course in Number Theory and Cryptography", Second edition, Springer- Verlag, New York, 2014.

Unit	Chapter	Sections
Ι	III	Sec 1-2 (Pages 54-74)
II	IV	Sec 1-3 (Pages 83-103)
III	V	Sec 1-2 (Pages 126-134, 138-142)
IV	V	Sec 3-4 (Pages 143-159)
V	VI	Sec 1-3 (Pages 166-182, 191-192)

### **References:**

- 1. D.R.Stinson, "Cryptography", CRC Press, New York, 1995.
- 2. A. J Meneze, P.R.Oorche and S.A Vans ton "Hand book of applied Cryptography", Crc Press New York, 1995.
- 3. William Stallings, "**Cryptograpy and Network Security Principles and Practice**" Prentice Hall, Fifth Edition, New Delhi, 2011.

- 1. <u>http://abel.harvard.edu/quals/index.html</u>[HavardUniversity]
- 2. <u>https://www-wp.maths.cam.ac.uk/documents/schedules.pdf/</u>[CambridgeUniversity]

				CO	s VS PO	Os					
	PO 1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	<b>PO8</b>	PO9	PSO1	PSO2
CO 1	3	3	2	0	1	3	3	3	3	3	0
CO 2	3	3	3	1	2	3	3	3	3	3	1
CO 3	3	2	1	0	0	2	2	2	3	2	0
CO 4	3	3	2	0	1	3	3	3	3	3	0
CO 5	3	3	2	0	1	3	3	3	3	3	0
TOTAL	15	14	10	1	5	14	14	14	15	14	1
SCALED VALUE	3	3	2	1	1	3	3	3	3	3	1
0 - No Relation, 1 -	Low Rel	lation, 2	2- Medi	um Re	lation, .	3- High	Relatio	on	L	•	
1-5→1, 6-10→2, 11-	15→3										

0	Course Nai	ne	FORMAL LANGUAGES AND AUTOMATA THEORY	L	Т	Р	C
(	Course Co	de	YMA1E2C	3	1	0	4
С	Р	Α		L	T	P	H
$\frac{4}{\text{DDEDE}}$		0	Knowledge about Set theory, Relations,	3	$\frac{1}{ndh}$	0	4
FNENE	QUISITE		concepts of Grammars.		ina o	asic	
found • Class • Emp	ourposeoft dations of sify mach loyfinites	comput nines by statemac	eistoacquaintthestudentwithanoverviewoft er science from the perspectiveofformallan theirpower to recognize languages. chinestosolveproblemsin computing.		cal		
• Expl	aindeterr		ndnon-deterministic machines. DURSE OUTCOMES	DOMAIN	N	LEVI	EL
CO 1	Explain	finite auto	omata and regular expressions	Cognitive	e 1	Understa	nding
CO 2	Construc	et NFA to	DFA and minimization DFA	Cognitive	e	Apply	ing
CO 3	Determin Gramma		Trees and normal forms of Context Free	Cognitive	2	Evalua	ting
CO 4	Analyze	the Equiv	valence of PDA's and CFG's	Cognitive	*	Analyz	zing
CO 5	Determi	ne the Pur	nping Lemma for Context-free Languages	Cognitive	e	Evalua	ting
UNIT I	Finite A	utomata	and Regular Expressions				9+3
			rministic Finite state Automata- Non determi sitions – Regular Expressions- Finite Automata a				Finit
	-		ular Languages	<u>ina reegunar</u>	2.1.1.1.1		9+3
The Pur Regular	mping Ler Languages	nma for I s – Revers	Regular Languages – Application of the Pumping al – Homomorphism – Decision properties of Reg zation of DFA's.				rties c
			ammars and Languages				9+3
	Free Gram		arse Trees – Normal forms for Context Free Gran	nmars – Ch	omsky	y Norma	l For
	Pushdov		nata				9+3
	1		of a PDA – Equivalence of PDA's and CFG's – D				

Automata	1.							
								1
UNIT 5	Propertie	s of Context-	Free Language	es				9+3
The Pun	ping Lemr	na for Contex	t-free Language	es – Closu	re Properties of Co	ontext- Fre	e Languages	1
	1 0	es of CFL's.					88	
	ΓURE	45	TUTORIAL	15	PRACTICAL	0	TOTAL	60
Text Boo	ok:							1
1. Jol	nn. E. Hope	raft. Rajeev N	Aotwani and Jef	frev D. U	llman, Introduction	n to Auton	nata	
	-		omputation, Pear	•				
	J / L	0	1 ,		,			
Reference	es:							
1. A Salo	maa, Forma	al Languages,	Academic press	s, New Yo	ork, 1973			
		00	-		Computations (2n	dEdn), Ta	ta – McGraw H	Hill
compar	y Ltd., Nev	w Delhi, 1997		•	•			
Website	and e-Lear	rning Source:	NPTEL Course	es and MC	OOC Courses.			

				CO	s VS PO	Os					
	<b>PO 1</b>	PO2	PO3	<b>PO4</b>	PO5	PO6	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	PSO1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	3	3	2	0	1	3	3	3	3	3	0
CO 3	3	3	3	2	3	3	3	3	3	3	2
CO 4	3	3	3	1	2	3	3	3	3	3	1
CO 5	3	3	3	2	3	3	3	3	3	3	2
TOTAL	15	14	12	5	9	14	14	14	15	14	5
SCALED VALUE	3	3	3	1	2	3	3	3	3	3	1
0 - No Relation, 1 –	Low Rel	lation, 2	2- Medi	ium Re	lation, 3	3- High	Relatio	on			
$1 - 5 \rightarrow 1, 6 - 10 \rightarrow 2, 11 -$	15→3										

# **SEMESTER II**

C	ourse Nam	ie	ADVAN	CED AL	GEBRA	L	Т	Р	C
(	Course Cod	e		<b>YMA201</b>		4	1	0	5
С	Р	Α				L	Т	Р	Η
5	0	0				4	1	0	5
PRERE	QUISITE	В	asicknowledge	fromCLa	inguage				÷
Objectiv									
The ma	in objectiv	ves of this c	ourse are: To st	udy field	extension, roots	of polyn	omials,	Galois	S
Theory,	finite field	ds, division	rings, solvabilit	y by radi	cals and to deve	lop comp	utation	al skill	in
abstract	algebra.					T			
		COUR	SE OUTCOME	S		DOMA	IN	LEV	ΈL
CO 1	Explain	basic proper	ties of Extension	Fields and	1	Cogniti	ve I	Underst	anding
	Transcer								
<b>CO 2</b>	Solve po	lvnomial eq	uations by radical	s along wi	Cogniti	ve	Appl	ving	
			equations by radicals along with the Cognitive ruler and compass constructions.					11	
<b>CO 3</b>	Fynlain	the basic as	pects of elements	of Colois	theory	Cogniti	Understandin		
	Ехріані	the basic as	pects of elements	of Galois	uleory.				
<b>CO 4</b>	<b>C</b>	••••••••••••••••••••••••••••••••••••••		£	• • • • • • • • • • • • • • • • • • • •	Cogniti	Underst	andino	
	Summa	rize wedder	burn's theorem or	i finite div	ision rings.	Coginti		onderst	anang
CO 5	Demons	trate the bas	sic mathematical i	Cogniti	ve I	Underst	anding		
000		is and square			008			C	
UNIT I		1						-	12 + 3
	n fields – T	ranscendenc	e of e.						
UNIT 2			• • • • •					-	12 + 3
	Polvnomia	ls More ab	out roots.						
UNIT 3								-	12 + 3
Element	s of Galois	theory.							
UNIT 4		~							12 + 3
Finite fie	elds - Wedd	erburn's theo	orem on finite div	ision rings					
					•				
UNIT 5									12 + 3
Solvahi	lity by radie	cals - A theo	rem of Frobenius	- Integral	Quaternions andt	ternions and the Four- Square the			
	roupsovertl			- megral	Quaternions and	ner our- St	Jorenn.		
	TURE	<u>60</u>	TUTORIAL	15	PRACTICAL	0	TOT		60
, H, C									

### **Text Book:**

1. I.N. Herstein.TopicsinAlgebra (IIEdition)WileyEastern Limited, NewDelhi, 1975.

τ	Unit	Chapter	Sections
	Ι	5	Section 5.1 and 5.2
	II	5	Sections5.3 and 5.5
	III	5	Section5.6
	IV	7	Sections7.1and7.2(Theorem7.2.1only)
	V	5	Section5.7(omitLemma5.7.1,
	V	7	Lemma5.7.2andTheorem5.7.1)
			Sections7.3 and7.4

### **References:**

- 1. M.Artin, Algebra, Prentice Hallof India, 1991.
- 2. P.B.Bhattacharya,S.K.Jain,andS.R.Nagpaul,BasicAbstractAlgebra(II Edition)Cambridge UniversityPress, 1997. (Indian Edition)
- I.S.LutherandI.B.S.Passi,Algebra,Vol.I– Groups(1996);Vol.IIRings,NarosaPublishingHouse, NewDelhi, 1999
- 4. D.S.Malik, J.N.Mordesonand M.K.Sen, Fundamental of Abstract Algebra, McGraw Hill ( International Edition), New York. 1997.
- 5. N.Jacobson, BasicAlgebra, Vol. I&II HindustanPublishingCompany, NewDelhi.

- 1. <u>http://mathforum.org</u>,
- 2. http://ocw.mit.edu/ocwweb/Mathematics
- 3. <u>http://www.opensource.org</u>,
- 4. <u>www.algebra.com</u>

	COs VS POs													
	<b>PO 1</b>	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PSO1	PSO2			
CO 1	3	2	1	0	0	2	2	2	3	2	0			
CO 2	3	3	2	0	1	3	3	3	3	3	0			
CO 3	3	2	1	0	0	2	2	2	3	2	0			
CO 4	3	2	1	0	0	2	2	2	3	2	0			
CO 5	3	2	1	0	0	2	2	2	3	2	0			
TOTAL	15	11	6	0	1	11	11	11	15	11	0			
SCALED VALUE	3	3	2	0	1	3	3	3	3	3	0			
0 - No Relation, 1 -	0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation													
$1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-$	15→3		$1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$											

	Course Nam Course Code	-	COMPLEX ANALYSIS YMA202	L 4	Т 1	P 0	C 5	
C	P	A	1 11/1/202	L	T P		H	
5	0	0		4	1	0	5	
	QUISITE		Basics laws of arithmetic - Geometric re numbers - Differentiation and Integration feeling and computational skill.					
*Comp and is a *In mo and the *Anoth	g students to lex analysis llso used the dern times e pictures er importar	s, in par roughou , it has of frac nt applie	rticular the theory of conformal mappings, ha ut analytic numbertheory. s become very popular through a new bo ctals produced by iterating holomorphic fun cation of complex analysis is in stringtheory	ost from co ctions.	mple	ex dyna	mics	
invaria	nts in quant		d theory. DURSE OUTCOMES	DOMAIN	I	LEVI	FT.	
			JURGE OUTCOMES	DOMAIN				
CO 1			e basic concept of line integrals, rectifiable arcs nd prove Cauchy's theorems.	Cognitive Underst			standing	
CO 2			e homology in complex plain and prove residue	Cognitive	Cognitive Understan			
CO 3	<b>Explain</b> examples		onical products and gamma functions with	Cognitive	-	Understa	nding	
CO 4	<b>Illustrat</b> mapping		e of the reflection principle and prove Riemann	Cognitive Unders		Understa	nding	
CO 5	Explain	the gene	eral properties of elliptic functions.	Cognitive		Understa	nding	
UNIT I	Complex	Integra	tion			1	2+3	
Fundam	ental Theore	ems: Cau	uchy's Theorem for a Rectangle- Cauchy's Theor	em in a Disk	. Cai	uchy's In	tegra	
Formula	a: The Index	of a poi	nt with respect to a closed curve - The Integral for	ormula – Hig	her d	erivative	es.	
Local P	roperties of a	analytica	al Functions:Removable Singularities- Taylors's	Гheorem – Z	eros	and pole	s –	
The loca	al Mapping -	- The M	aximum Principle.					
UNIT 2	Complex	Integra	tion			1	2+3	
	neral form of	Cauchy	y's Theorem: Chains and cycles- Simple Continui	•		The Gene		
			rem - Proof of Cauchy's theorem - Locally exact	differentials-	Mu	tilply		
			theorem - The argument principle.	ita inta anal-	Dat	Simitian -	£	
		-	rals and Harmonic Functions: Evaluation of defin c properties - Mean value property - Poisson form	-	- Del	muon o	1	
UNIT 3			ict Developments	iu1a.		1	2+3	
OTHE 2	beries all	u i i vul				1	<u></u>	

Partial Fractions and Entire Functions: Partial fractions - Infinite products - Canonical products - Gamma Function- Jensen's formula - Hadamard's Theorem.Riemann Theta Function and Normal Families: Product development – Extension of  $\zeta$  (s) to the whole plane – The zeros of zeta function – Equicontinuity – Normality and compactness – Arzela's theorem – Families of analytic functions – The Classical Definition. **UNIT 4** | Conformal mappings 12 + 3Riemann mapping Theorem: Statement and Proof – Boundary Behaviour – Use of the Reflection Principle. Conformal mappings of polygons: Behaviour at an angle – Schwarz- Christoffel formula – Mapping on a rectangle. Harmonic Functions: Functions with mean value property - Harnack's principle. UNIT 5 **Elliptic functions** 12 + 3Simply Periodic Functions : Representation by Exponentials-The Fourier Development - Functions of Finite Order.Doubly Periodic Functions:The Period Module-Unimodular Transformations - The Canonical Basis-General Properties of Elliptic Functions. Weierstrass Theory: The Weierstrass  $\beta$ -function–The functions  $\zeta$ (s) and  $\sigma$  (s)-The differential equation – The modular equation  $\lambda(\tau)$  – The Conformal mapping by  $\lambda(\tau)$ . LECTURE TUTORIAL 15 PRACTICAL TOTAL 60 0 60 Text Book: 1. Lars F. Ahlfors, Complex Analysis, (3rd Edition) McGraw Hill Book Company, New York, 1979 **References:** 1. H.A. Presfly, Introduction to complex Analysis, Clarendon Press, ford, 1990. 2. J.B. Corway, Functions of one complex variables, Springer - Verlag, International student Edition, Narosa Publishing Co. 3. E. Hille, Analytic function Theory (2 vols.), Gonm& Co, 1959. 4. M.Heins, Complex function Theory, Academic Press, New York, 1968. Website and e-Learning Source https://nptel.ac.in **COs VS POs** PSO2 **PO**1 **PO2** PO3 **PO4** PO5 **PO6 PO7 PO8 PO9 PSO1 CO1** 3 2 1 0 0 2 2 2 3 2 0 3 2 3 0 0 2 2 2 2 0 **CO 2** 1 3 3 **CO 3** 2 1 0 0 2 2 2 2 0 3 2 2 2 3 **CO**4 1 0 0 2 2 0 **CO 5** 3 2 1 0 0 2 2 2 3 2 0 TOTAL 15 10 5 0 10 10 10 15 10 0 0 SCALED VALUE 2 2 3 1 0 0 2 2 3 2 0 0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation  $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$ **Course Name** PARTIAL DIFFERENTIAL EQUATIONS Т Ρ L С 1 **Course Code YMA203** 4 0 5 С Р L Т Р Η A 0 1 0 5 5 0 4 PREREQUISITE The only prerequisite is a good course in Calculus. **Objective:** 

The students can be able to

- 1. Describe real world system using Partial Differential Equations.
- 2. Identify, analyse, and subsequently solve physical situations whose behavior can be described by Partial Differential Equations.

	COURSE OUTCOMES	DOMAIN		EVEL						
CO 1	<b>Recall</b> the basic concept of first order P.D.E and classification of integrals with examples.	Cognitive	Rem	embering						
CO 2	plain the origin of second order P.D.E with examples. Cognitive Understand									
CO 3	<b>Apply</b> the concept of Laplace equation to solve boundary value problems.									
<b>CO 4</b>	Classify wave equation with examples.	Cognitive	Ar	alyzing						
CO 5	Appraise the elementary solution of diffusion equation.	raise the elementary solution of diffusion equation. Cognitive Eva								
UNIT I	PARTIAL DIFFERENTIAL EQUATIONS OF THE FIRST O	RDER		12 + 3						
	ifferential Equations – Origins of First Order Differential Equations		Problem f							
	ations – Linear Equations of the first order – Nonlinear partial differ	-								
_	Cauchy's method of characteristics – Compatible system of First order	-								
	g Given Condition, Jacobi's method.	1								
UNIT 2	PARTIALDIFFERENTIALEQUATIONSOFTHE2nd			12 + 3						
-	in of Second Order Equations – Linear partial Differential Equatio									
	s with variable coefficients – Separation of variables – The method	of Integral T	ransform	s – Non –						
-	LAPLACE'S EQUATION			12 + 3						
	ry solutions of Laplace equation – Families of Equipotential Surfac	as Bounda	ry voluo i							
Separatio	on of variables – Surface Boundary Value Problems – Separation of metry – The Theory of Green's Function for Laplace Equation.									
UNIT 4				12 + 3						
	urrence of the wave equation in Physics – Elementary solutions of the	e one – dime	nsional u							
	menee of the wave equation in raysies - Elementary solutions of the	conc unne		ave						
The Occu	x = Vibrating membrane Application of the calculus of variations = $1$									
The Occu equations	s – Vibrating membrane, Application of the calculus of variations – T solutions of the wave equation.									
The Occu equations										
The Occu equations General s <b>UNIT 5</b> Element	solutions of the wave equation.	Three-dimens		blem –						

#### **Text Book:**

 K. Sankara Rao, Introduction to Partial Differential Equations, Second edition – Prentice – Hall of India, New Delhi 2006

#### **References:**

- 1. Ian Sneddon Elements of Partial Differential Equations McGraw Hill International Book Company, New Delhi, 1983
- 2. M.D. Raisinghania Advanced Differential Equations S. Chand and Company Ltd., New Delhi, 2001
- J.N. Sharma & K. Singh Partial Differential Equations for Engineers & Scientists, Narosa Publishing House, 2001
- 4. R. Dennemeyer, Introduction to Partial Differential Equations and Boundary value Problems, McGraw Hill Book Company, New York, 1968.

Website and e-Learning Source: ; https://nptel.ac.in

COs VS POs											
	<b>PO 1</b>	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	<b>PO8</b>	PO9	PSO1	PSO2
CO 1	2	1	0	0	0	1	1	1	2	1	0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	3	2	0	1	3	3	3	3	3	0
CO 4	3	3	3	1	2	3	3	3	3	3	1
CO 5	3	3	3	2	3	3	3	3	3	3	2
TOTAL	14	12	9	3	6	12	12	12	14	12	3
SCALED VALUE	3	3	2	1	2	3	3	3	3	3	1
0 - No Relation, 1 – 1	Low Rel	lation, 2	2- Medi	ium Re	lation, 3	3- High	Relatio	n			

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$ 

Course Name			ADVANCED NUMERICAL METHODS	$\mathbf{L}$	Т	Р	C
<b>Course Code</b>			<b>YMA204</b>	4	1	0	5
С	Р	Α		L	Т	Р	Н
5	0	0		4	1	0	5
PRERE	OUISITE		Knowledge about Number system, polyno	mials ar	nd mati	rices.	

### **Objective:**

The objective of this course is to develop Numerical computational skills and to study their applications. This course focuses on the topics Interpolation by polynomials, the solution of nonlinear equations, Numerical differentiation and Numerical Integration.

	COURSE OUTCOMES	DOMAIN	LEVEL
CO 1	<b>Apply</b> the mean value theorem for derivatives and integrals to find specified point and verify this point lies inside the given integral.	Cognitive	Applying
CO 2	<b>Evaluate</b> up to cubic polynomials using appropriate methods.	Cognitive	Evaluating

CO 3	Analyze methods		of nonlinear equa	ations by	the appropriate	Cogniti	ive Ar	Analyzing					
CO 4	Examine	<b>Examine</b> the triangular factorization is unique. Cognitive Ar											
CO 5		<b>Estimate</b> the value of the given integrals using appropriate methods. Cognitive Ev											
UNIT I	Number	Number Systems and Errors											
The Repr	resentation	of Integers -7	The Representation	on of Fra	ctions - Floating po	int arithm	netic-Loss o	f					
Significa	nce and Err	or Propagation	on – Computatio	nal Meth	ods for error estima	tion-Som	e comments	on					
converge	nce of sequ	ences-Some	mathematical pro	eliminari	es.								
UNIT 2 Interpolation by polynomials													
					olating polynomial a function table bas								
UNIT 3	The solut	tion of nonlin	near equations			-		12 + 3					
A survey Muller's		ve methods-F	ixed point iterat	ion-Poly	nomial Equations:	Real Roo	ots-Complex	roots ar					
UNIT 4	Matrices	and Systems	s of Linear equa	tions				12 + 3					
The solut	ion of linea	ar systems by	elimination-The	pivoting	g strategy - The t	riangular	factorizatio	1.					
UNIT 5	Different	iation and Ir	ntegration					12 + 3					
Numerica	al differenti	ation- Nume	rical Integration:	Some ba	sic rules-Composit	e rules.							
LEC	TURE	60	TUTORIAL	15	PRACTICAL	0	TOTAL	75					
Text Boo													
	mentary N		•		coach by Samuel D. 3.6, 3.7, 4.2 to 4.4, 7								
Reference		.1 10 1.7, 2.1		.1, J.J, .	,, 5.7, 4.2 10 4.4,	1.1, 1.2 ai							
		et al. Classica	al and modern N	umerical	Analysis, CRC Pre	ss,Copyri	ght 2009.						
1. Az	ing suckien												

COs VS POs											
	<b>PO 1</b>	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 1	3	3	2	0	1	3	3	3	3	3	0
CO 2	3	3	3	2	3	3	3	3	3	3	2
CO 3	3	3	3	1	2	3	3	3	3	3	1
CO 4	3	3	3	1	2	3	3	3	3	3	1

		3	3	3	2	3	3	3	3	3		3	2
TOTAL		15	15	14	6	11	15	15	15	15		15	6
<b>CALE</b>	D VALUE	3	3	3	2	3	3	3	3	3		3	2
- No R	elation, 1 –	Low Re	lation, 2	2- Medi	ium Re	lation,	- 3- High	Relatio	n				
5→1,	6-10→2, 11	-15→3											
	ourse Nam			RESO	TEC	MANA	ES	ENT		L	T	P	
C	Course Code	e		RESO	TEC		ES	ENT		3	1	0	4
				RESO	TEC	HNIQU	ES	<u>ENT</u>					4 H
C 4	Course Code P 0 QUISITE	e A	Basic		TEC YN	HNIQU IA2E1	IES A			3 L 3	1 T 1	0 P	C 4 H 4

		COURS	E OUTCOME	S		DOMAI	N L	EVEL
CO 1	Identify t	he optimal all	ocation using se	quencing	g problems.	Cognitiv	e Aj	oplying
CO 2	Apply Dy programm		amme to find	the solut	ion of L.P.P. by	Cognitiv	e Aj	oplying
CO 3	Apply Re	placement pol	icy to find the s	olutions.		Cognitiv	e Al	oplying
CO 4	Analyze v problems.	• •	of queuing prob	olems wit	th suitable simple	Cognitiv	e An	alyzing
CO 5	-		of problems of inventory theory		inisticmodels and	Cognitiv	e Aj	oplying
UNIT I	Sequencia	ng Problems						9+3
			niobs and two i	nachines	– n jobs and m	nachines –	solved pr	
-	and m mach	-			in joos and in i		501, <b>00</b> p1	00101115
0		Programmin	g					9+3
Introduct	tion - Recur	0	nip – Dynamic p	orogramn	ning algorithms – s	olved probl	ems – Solu	
		nent Theory						9+3
			v for equipmen	t which	deteriorates gradua	llv – Repla	cement of	
			lity and staffing					
UNIT 4	-				1			9+3
Introduct	tion – Class	ification of O	ueues – Oueuing	Problem	ns -(M/M/1): (∞/FC	(TFS) - (M/I)	M/1): (N/F	CFS) –
		-			ems of the above ty			~)
UNIT 5	Inventory			eu proon		P <b>0</b> 51		9+3
	,							
					th no shortages –			
shortages			-		problemswithshort	ages –EC	Qsystemo	forderin
	TURE	45	Probabilisticmo	$\frac{15}{15}$	PRACTICAL	0	TOTAL	60
LEC	IUKL	43	TUTORIAL	15	INACIICAL	U	IUIAL	00
Text Bo	ok•							
		operations Re	search. PK Gup	ta & Ma	n Mohan, Fourteen	th		
		1	ons, New Delhi,		- · · · · · · · · · · · · · · · · · · ·			
		Unit	Chapter		Pages			
		Ι	Chapter 17		383 - 399			
		II	Chapter18		409-428			
		III	Chapter24		619 - 630			
		IV	Chapter22		535 - 556			
		1 V						
		V	Chapter23		571 - 600			

- 1. OperationsResearch-AnIntroduction-H.A.Taha-PrenticeHallPublication.
- 2. OperationsResearch-S.D.Sharma-KedarnathRamnath&Co.,
- 3. OperationsResearch PK.GuptaandD.S.Hira SultanChand&Sons.
- 4. OperationsResearch– PathakH.K,PradeepKJoshiandSharma.C,ShreeShikshaSahityaPrakashan, Meerut, Second edition,2022.

## Website and e-Learning Source

- 1. <u>http://www.drps.ed.ac.uk/18-19/dpt/cxmath11194.htm</u>[TheUniversityofEdinburgh]
- 2. <u>maths.cam.ac.uk/undergrad/files/schedules.pdf</u>[UniversityofCambridge]

					CO	s VS PO	Os					
		<b>PO 1</b>	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PSO1	PSO2
CO 1		3	3	2	0	1	3	3	3	3	3	0
CO 2		3	3	2	0	1	3	3	3	3	3	0
CO 3		3	3	2	0	1	3	3	3	3	3	0
CO 4		3	3	3	1	2	3	3	3	3	3	1
CO 5		3	3	2	0	1	3	3	3	3	3	0
TOTAL		15	15	11	1	6	15	15	15	15	15	1
SCALED Y	VALUE	3	3	3	1	2	3	3	3	3	3	1
0 - No Rela	,		lation, 2	2- Medi	ium Re	lation, 3	3- High	Relatio	)n			
$1-5\rightarrow 1, 6-1$	<u>10→2, 11-</u>	15→3							<u>.</u>			
Cou	irse Name	9			TA SCI PROG			R		L	Г Р	С
Cor	ırse Code				YN	<b>IA2E1I</b>	3			3	1 0	4
C	P	Α									Г Р	Н
4	0	0								3	1 0	4
PREREQU			Knov opera	-	about	basic c	omput	er prog	grammi	ng com	nands ar	nd

#### **Objective:**

- 1. Learn Fundamentals of R.
- 2. Covers how to use different functions in R, how to read data into R, accessing R packages, writing R functions, debugging, and organizing data using R functions.
- 3. Cover the basics of statistical data analysis with examples.
- 4. The whole syllabus will give an idea to collect, compile and visualize data using statistical functions.

	COURSE OUTCOMES	DOMAIN	LEVEL
CO 1	Explain the basics of R.	Cognitive	Understanding
CO 2	<b>Apply</b> the R Data Types Vectors, Lists, Matrices, Arrays, Factors, Data Frame.	Cognitive	Applying
CO 3	Make use of R-Function, R Strings R Matrices, and R Arrays.	Cognitive	Applying
CO 4	Make use of CSV File and Excel Loading and handling Data inR.	Cognitive	Applying
CO 5	<b>Determine</b> measures of central tendency and dispersion.	Cognitive	Evaluating
Data typ Relation Making:	Sypes Vectors, Lists, Matrices, Arrays, Factors, Data Frame – R - Va es of Variable, Finding Variable ls(), Deleting Variables - R Operator al Operators, Logical Operator, Assignment Operators, Miscellaneou if statement, if – else statement, if – else if statement, switch stateme	rs: Arithmetic s Operators - R	Operators, Decision
UNIT 3 R-Functi function, R-String Sequence sorting - Merging Computa	loop - Loop control statement: break statement, next statement. on : function definition, Built in functions: mean(), paste(), sum(), r calling a function, calling a function without an argument, calling a s – Manipulating Text in Data: substr(), strsplit(), paste(), grep(), to e vector, rep function, vector access, vector names, vector math, w R List - Creating a List, List Tags and Values, Add/Delete Elemen Lists, Converting List to Vector - R Matrices – Accessing S tions: Addition, Subtraction, Multiplication and Division- R Array g Array Elements, Manipulating Array Elements, Calculation Across	function with upper(), tolower vector recyclin t to or from a Elements of a s: Naming Co	argument values er() - R Vectors - g, vector elemen List, Size of List a Matrix, Matrix lumns and Rows ats - R Factors.
ncol(), st Data Fra	mes –Create Data Frame, Data Frame Access, Understanding Data ir r(), Summary(), names(), head(), tail(), edit() functions - Extract Data me: Add Column, Add Row - Joining columns and rows in a Data fra Data frames merge() – Melting and Casting data melt(), cast().Loadi	a from Data Fra ame rbind() and	ame, Expand d cbind() –

Writing into a CSV File – R -Excel File – Reading the Excel file.

#### UNIT 5 9 + 3Descriptive Statistics: Data Range, Frequencies, Mode, Mean and Median: Mean Applying Trim Option, Applying NA Option, Median - Mode - Standard Deviation - Correlation - Spotting Problems in Data with Visualization: visually Checking Distributions for a single Variable - R –Pie Charts: Pie Chart title and Colors – Slice Percentages and Chart Legend, 3D Pie Chart – R Histograms – Density Plot - R – Bar Charts: Bar Chart Labels, Title and Colors. LECTURE 45 TUTORIAL 15 PRACTICAL 0 TOTAL 60 **Text Book:** 1. Sandip Rakshit, R Programming for Beginners, McGraw Hill Education (India), 2017, ISBN: 978-93-5260-455-5.

#### **References:**

1. Seema Acharya, Data Analytics using R, McGrawHill Education (India), 2018, ISBN: 978-93-5260-524-8.

Website and e-Learning Source

#### 1. <u>https://www.tutorialspoint.com/r/r_tutorial.pdf</u>

				CO	s VS PO	Os					
	PO 1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PSO1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	3	3	2	0	1	3	3	3	3	3	0
CO 3	3	3	2	0	1	3	3	3	3	3	0
CO 4	3	3	2	0	1	3	3	3	3	3	0
CO 5	3	3	3	2	3	3	3	3	3	3	2
TOTAL	15	14	10	2	6	14	14	15	15	14	2
SCALED VALUE	3	3	2	1	2	3	3	3	3	3	1
0 - No Relation, 1 –	Low Re	lation, 2	2- Medi	ium Re	lation, 3	3- High	Relatio	n			
$1-5{\rightarrow}1, 6-10{\rightarrow}2,$	11 – 15-	→3									
Course Name	9	I	PYTHC	N FOF	R MAT	HEMA	TICS		L	Г Р	C

C	ourse Cod	le	Y	<b>MA2E1</b>	C	3	1	0	4
С	Р	Α				L	Т	Р	Η
4	0	0				3	1	0	4
	QUISITE		Basic Computer K	Knowledg	e				
2. learn	luce a usef how to wo	rk with v	ng language arious data formats w ples and dictionaries i	•					
		CO	OURSE OUTCOME	S		DOMAI	IN	LEV	EL
CO 1	Explain t	he overvi	ew of python.			Cognitiv	ve U	Jndersta	anding
CO 2	Make use	e of Contr	rol Statements & Fund	ctions.		Cognitiv	ve	Apply	ving
CO 3	Explain S	Strings an	d Lists.			Cognitiv	ve t	Jndersta	anding
CO 4	Create G	raphs wit	h Matplotlib – Plottin	ng with Fo	ormulas.	Cognitiv	ve	Creat	ing
CO 5	Describe with Sym		th Statistics and Alg	gebra and	Symbolic Math	Cognitiv	ve l	Jndersta	anding
UNIT I	Introduc	tion to P	ython						9+3
Introduct	tion – Pyth	on Overv	view – Getting Starte	d with Py	thon –Comments	– Python 1	Identifi	ers – Re	eserve
Keyword	ls – Variab	les – Sta	ndard Data Types-Op	perators: 7	Types of Operator	s - Stateme	ent and	Express	sions
String O	perations.								
UNIT 2	Control	Statemer	nts & Functions						9+3
			- Input from Key						
Composi	tion of Fur	nctions –	User defined Functio	ns - Parar	neters and Argum	ents –Func	ction Ca	lls- The	e retur
statemen	t – Python	Recursiv	e Functions.						
UNIT 3	Strings a								9+3
			nd Lists- Strings - Lis	ts. Tuples	and Dictionaries:	Tuples – D	Dictiona	ries.	
UNIT 4	Visualizi	ng Data	with Graphs						9+3
	nding the ( ib – Plottin		Coordinate Plane – V	Vorking v	with List and Tuple	es – Creatir	ng Grap	hs with	
UNIT 5		<u> </u>	with Statistics and A	lgebra a	nd Symbolic Mat	h with Syn	nPy		9+3
			the Median – Finding	; the Mod	e and Creating a F	requency 7	Table. I	Defining	
•	and Symbo								

**Text Book:** 

- **1.** E.Balagurusamy, "IntroductiontoComputingandProblem-SolvingUsing Python", McGraw-Hill Education (India) Private Limited, 1st edition(2017).
- **2.** AmitSaha, "DoingMathwithPython", 1stedition, nostarchpress.

Unit	Text Book	Chapter	Sections
Ι	1	3	3.1-3.11Pg.no.(36-64)
п	1	3	3.13-3.15Pg.no.(65-74)
II	1	4	4.1-4.8Pg.no.(82-98)
TTT	1	5	5.1-5.2Pg.no.(112-132)
III	1	6	6.1-6.2Pg.no.(148-166)
IV	2	2	Pg.no.(43-73)
V	2	3	Pg.no.(82-93)
v	2	4	Pg.no.(117-139)

## **References:**

- 1. FabioNelli," PythonDataAnalytics", Apress, SecondEdition. (2018)
- 2. H.P.Langtangen, "APrimeronScientificProgrammingwithPython", Secondediti on, Springer, 2016.
- 3. Ashok Namdev Kamthane, Amit Ashok Kamthane, "Programming and ProblemSolvingwithPython",McGraw-HillEducation(India)PrivateLimited,Seconedition(2017).
- 4. ThomasNield, "Essential MathforData Science", O'ReillyMedia (2022).

## Website and e-Learning Source

- 1. <u>https://fangohr.github.io/python/book/Introduction-to-Python-for-</u> Computational-Science-and-Engineering.pdf
- 2. <u>https://sites.google.com/a/aicte-india.org/swayamrepo/big-data-analytics-for-smart-grid</u>
- 3. <u>https://youtu.be/sbGO9183Ewg</u>
- 4. https://wesmckinney.com/book/plotting-and-visualization.html

COs VS POs											
	PO 1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PSO1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	3	3	2	0	1	3	3	3	3	3	0
CO 3	3	2	1	0	0	2	2	2	3	2	0
CO 4	3	3	3	3	3	3	3	3	3	3	3

CO 5	3	2	1	0	0	2	2	2	3		2	0
TOTAL	15	12	8	3	4	12	12	12	15	1	12	3
SCALED VALUE	3	3	2	1	1	3	3	3	3		3	1
0 - No Relation, 1 – 2	Low Re	lation, 2	2- Medi	um Re	lation, 3	3- High	Relatio	on				
1-5→1, 6-10→2, 11-	15→3											
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Course Name Course Code			DATA		YSIS U 1A2E2A		SPSS		L 3	T 1	Р 0	C 4
Course Code	A			I IV	IAZCZE	•			J L	T T	<u> </u>	H H
4 0	0								3	1	0	4
PREREQUISITE		Probal	bility an	d Statis	stics					<b>.</b>		
<b>Objective:</b> The objective of this	course i	s to teac	h how t	o evolo	re anal	vze and	lunders	tand dat	a and he	wy the	softw	aro
SPSS (Statistical Pac						yze, and	i unuers	stand dat		w uic	5011W	arc
· · · · · · · · · · · · · · · · · · ·												
	CO	URSE (	OUTCO	OMES				DO	MAIN		LEV	EL

and Plotting of Charts using Bar and Pie diagram.       Indext and plotting of Charts using Bar and Pie diagram.         CO 2       Explain measures of central tendencies and measures of dispersion using SPSS.       Understanding of Charts using SPSS.         CO 3       Utilize concept of testing hypothesis for finding significance level for the given data using one sample t-test, independent sample t-test and paired t-test in SPSS.       Cognitive       Applying         CO 4       Apply One-way ANOVA, two-way ANOVA and Chi-square test for the given data in SPSS.       Cognitive       Applying         CO 5       Compare the relationship for the data using methods of correlation and regression in SPSS.       Cognitive       Applying         UNIT 1       9+       9+       Introduction to SPSS – Starting SPSS – SPSS Main Menus – Working with the Data Editor – SPSS Viewer       9+         Introduction to SPSS – Starting SPSS – SPSS Main Menus – Working with the Data Editor – SPSS Viewer       9+         Diagram.       9+         UNT 2       9+         Descriptive Statistics and Frequencies using SPSS. Measures of central tendencies: Arithmetic mea Median, Mode, Geometric mean and Harmonic Mean. Measures of Dispersion: Range, inter quartile rang Mean Deviation and Standard deviation. Measures of Skewness and Kurtosis.       9+         UNT 3       9+         Testing of Hypothesis: Type I error and Type II Errors – Concept of p values – Basic Concepts of Or Sample t-test, Independent Samples t-test, Paired samples t-test	CO 1	Explain (	basic concept	s of SPSS, wor	king with	n the Data Editor	Cognitiv	vo Undorst	anding
CO 2       ispersion using SPSS.       ng       Understanding dispersion using SPSS.         CO 3       Utilize concept of testing hypothesis for finding significance level for the given data using one sample t-test, independent sample t-test and paired t-test in SPSS.       Cognitive       Applying         CO 4       Apply One-way ANOVA, two-way ANOVA and Chi-square test for the given data in SPSS.       Cognitive       Applying         CO 5       Compare the relationship for the data using methods of correlation and regression in SPSS.       Cognitive       Applying         UNIT 1       9+         Introduction to SPSS – Starting SPSS – SPSS Main Menus – Working with the Data Editor – SPSS Viewer Importing and Exporting data. Plotting of Charts: Simple Bar diagram, Multiple Bar Diagram and P Diagram.       9+         UNIT 2       9+         Descriptive Statistics and Frequencies using SPSS. Measures of central tendencies: Arithmetic mea Median, Mode, Geometric mean and Harmonic Mean. Measures of Dispersion: Range, inter quartile rang Mean Deviation and Standard deviation. Measures of Skewness and Kurtosis.       9+         UNIT 3       9+         Testing of Hypothesis: Type I error and Type II Errors – Concept of p values – Basic Concepts of Or Sample t-test, Independent Samples t-test, Paired samples t-test using SPSS with interpretation.       9+         UNIT 4       9+         Analysis of Variance: Basic concepts of ANOVA – One Way and Two-Way ANOVA using SPSS with interpretation. Chi-square Test for Independence of attributes u		and Plottin	ng of Charts u	ising Bar and Pi	e diagran	1.	Cognitiv	e Unders	landing
dispersion using SPSS.       ng       Onderstanding         CO 3       Utilize concept of testing hypothesis for finding significance level for the given data using one sample t-test, independent sample t-test and paired t-test in SPSS.       Cognitive       Applying         CO 4       Apply One-way ANOVA, two-way ANOVA and Chi-square test for the given data in SPSS.       Cognitive       Applying         CO 5       Compare the relationship for the data using methods of correlation and regression in SPSS.       Cognitive       Applying         UNIT 1       9+         Introduction to SPSS – Starting SPSS – SPSS Main Menus – Working with the Data Editor – SPSS Viewer Importing and Exporting data. Plotting of Charts: Simple Bar diagram, Multiple Bar Diagram and P Diagram.       9+         UNIT 2       9+         Descriptive Statistics and Frequencies using SPSS. Measures of central tendencies: Arithmetic mea Median, Mode, Geometric mean and Harmonic Mean. Measures of Dispersion: Range, inter quartile rang Mean Deviation and Standard deviation. Measures of Skewness and Kurtosis.       9+         UNIT 3       9+         Testing of Hypothesis: Type I error and Type II Errors – Concept of p values – Basic Concepts of O Sample t-test, Independent Samples t-test, Paired samples t-test using SPSS with interpretation.       9+         UNIT 4       9+         Correlation : Chi-square Test for Independence of attributes using SPSS.       9+         Correlation: Chi-square Test for Correlation – Spearman's Rank correlati	<b>CO 2</b>	Explain	measures of	f central tende	encies a	nd measures of	Understa		1.
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Correlation: Karl Pearson's coefficient of Correlation – Spearman's Rank correlation – Simple line Regression using SPSS with interpretation.	UNIT 3 Testing Sample <b>UNIT 4</b>	of Hypothe t-test, Indepo	sis: Type I e endent Sampl	riation. Measure rror and Type I es t-test, Paired	es of Skev II Errors samples	wness and Kurtosis – Concept of p v t-test using SPSS v	s. alues – Ba vith interpro	sic Concepts etation.	9 + 3 of One 9 + 3
Regression using SPSS with interpretation.	UNIT 3 Testing Sample 1 UNIT 4 Analysis	of Hypother t-test, Indepo	sis: Type I e endent Sampl e: Basic conce	rror and Type I es t-test, Paired	es of Skev II Errors samples t – One W	wness and Kurtosis – Concept of p v t-test using SPSS v Vay and Two-Way	s. alues – Ba vith interpro	sic Concepts	9 + 3 of One 9 + 3
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analysis using SPSS, First Edition, Sage Publications. <b>References:</b> 3. Andy Field. (2011); Discovering Statistics Using SPSS, Sage Publications.	UNIT 3 Testing Sample 1 UNIT 4 Analysis interpret UNIT 5 Correlat Regressi LEC Text Bo 1. A a Referen 3. And	of Hypother t-test, Indepo- s of Variance ation. Chi-s ion: Karl P ion using SP CTURE ok: Ajai J Gaur a malysis usin ces: y Field. (201	sis: Type I e endent Sampl e: Basic conce square Test fo Pearson's coe SS with inter 45 and Sanjay S. g SPSS, First	riation. Measure rror and Type I es t-test, Paired epts of ANOVA r Independence fficient of Cor- pretation. TUTORIAL Gaur (2008): St Edition, Sage P	es of Skey II Errors samples f – One W of attribu relation 15 atistical N ublication	<ul> <li>wness and Kurtosis</li> <li>Concept of p v</li> <li>test using SPSS v</li> <li>Vay and Two-Way</li> <li>tes using SPSS.</li> <li>Spearman's Ra</li> <li>PRACTICAL</li> <li>Methods for Practions.</li> <li>Sage Publications</li> </ul>	alues – Ba vith interpro ANOVA u nk correla 0 ce and Rese	tion – Simpl TOTAL	9 + 3 of On 9 + 3 h 9 + 3 e linea 60

Website and e-Learning Source : ; https://nptel.ac.in

	<b>PO 1</b>	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PSO1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	3	2	0	1	3	3	3	3	3	0
CO 4	3	3	2	0	1	3	3	3	3	3	0
CO 5	3	3	2	0	1	3	3	3	3	3	0
TOTAL	15	13	8	0	3	13	13	13	15	13	0
SCALED VALUE	3	3	2	0	1	3	3	3	3	3	0
0 - No Relation, 1 – 1	Low Re	lation, 2	2- Medi	ium Re	lation, 3	3- High	Relatio	n			
1-5→1, 6-10→2, 11-	15→3										
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1-5→1, 6-10→2, 11- Course Name	15→3	NUM			ГНОDS MAT I	S PRAC	CTICAI		. T	Р	C
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Being able to do simple calculations using MATLAB

CO 2UsCO 3DeCO 3DeCO 4W maCO 5Gr imTHEORYMATLAB ba operators and review, Vector data, file handEXPERIMENT1. Study of Im 2. Study of ba 3. To solve lin	environment. Use the MATLA Design simple a Write simple pro mathematical pr	entations and tips for	oblems. to solve sci	ientific and	Affec Cogn Psych Cogn Psych Affec Cogn	itive nomotor itive nomotor itive nomotor ctive itive nomotor	Guided Respon Respon	nse nding standing d nse nding d nse nding ing d
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MATLAB ba operators and review, Vecto data, file hand <b>EXPERIME</b> 1. Study of In 2. Study of ba 3. To solve lir				and	Psych Affec	nomotor	Applyi Guided Respon	ing d nse
operators and review, Vecto data, file hand <b>EXPERIME</b> 1. Study of In 2. Study of ba 3. To solve lir								30
<ol> <li>Study of In</li> <li>Study of ba</li> <li>To solve lir</li> </ol>	nd simple calcu stors and matrice ndling, Personal	ATLAB environment lations, Formulas and es in MATLAB, Matr ized functions, Toolb	d function rix operation	s, MATLAB toons and function	oolboxes ns in MA	, Matrix a TLAB Re	and line	ar algebr nd writing
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<ol> <li>5. Determinat</li> <li>6. Solution of</li> <li>7. Solution of</li> <li>8. Solution of</li> <li>9. Determinat</li> <li>10. Determinat</li> </ol>	ation of Eigen v of Difference Ec of Difference Ec of differential ec ation of roots of nation of polyno	rations ons for Underdetermin alues and Eigen vecto juations. juations using Euler M juation using 4th orde	ors of a squ Method. er Runge- H f Least Squ	are matrix. Kutta method. aare Curve Fitti	ng.	ounds from	n the giv	ven data.
LECTUR		TUTORIAL	0	PRACTICA		ΤΟΤΑ		60

### **Text Book:**

Amos Gilat 'MATLAB, An Introduction with Applications',3rd edition, Wiely publishers,2008
 Stephen J. Chapman' MATLAB Programming for Engineers' 5th edition, Cengauge learninb,2016
 Holly Moore 'MATLAB for Engineers', 5th edition, Pearson, 2012

### **References:**

- 1 "IntroductionToMatlabforEngineeringStudents",DavidHoucqueNorthwestern University,(version 1.2, August 2005)
- 2. "GettingStartedwithMATLAB–AQuickIntroductionforScientistsandEngineers" by R.Pratap,OxfordUniversityPress,NewDelhi,2010.
- **3.** "Introduction toMATLAB®forEngineers",WilliamJ.PalmIII,UniversityofRhodeIsland,McGraw Hill, ThirdEdition, 2011.

## Website and e-Learning Source

- 1. https://nptel.ac.in/courses/122106033
- 2. <u>https://www.youtube.com/watch?v=83S48Fs9WhY</u>
- 3. https://archive.nptel.ac.in/courses/103/106/103106118/
- 4. <u>https://www.youtube.com/watch?v=qpZUQTjFk6Q</u>

				CC	)s VS P	Os					
	PO 1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PSO 1	PSO2
CO 1	3	2	1	0	0	2	2	2	3	2	0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	3	2	0	1	3	3	3	3	3	0
<b>CO 4</b>	3	3	2	0	1	3	3	3	3	3	0
CO 5	3	3	2	0	1	3	3	3	3	3	0
TOTAL	15	14	8	0	3	14	14	14	15	14	0
SCALED VALUE	3	3	2	0	1	3	3	3	3	3	0
0 - No Relation, 1 – 1-5→1, 6-10→2, 11	-15→3	lation, 2	2- Medi	ium Re	lation, .	3- High	Relatio	on			
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40PREREQUISITEObjective:	U	Basic	knowle	dge of	prograi	mming,	statisti		2 thematic	-	4

Learning Objectives

- Learn the implementation of basics of Python and text pre-processing
- Learn the implementation of classification and clustering algorithms
- Learn the implementation of visualization

	ction to machine learning- Supervised and Unsupervised Learning, Model develop ion, Model Visualization, Prediction and Decision Making, Model Evaluation: O nd Model Selection.	LEVEL	
CO 1	<b>Demonstrate</b> the basics of python for performing data analysis.	Cognitive	Apply
CO 2	<b>Demonstrate</b> the use of text preprocessing, regression.	Cognitive	Apply
CO 3	<b>Demonstrate</b> the use of classification algorithms.	Cognitive	Apply
structured and Expo Missing V UNIT 2	and unstructured data, Data Analysis process, Dataset generation orting Data, Basic Insights from Datasets, Cleaning and Preparing Values.	n, Importing I g the Data: Ide	Dataset: Importi entify and Hand 12
	on to machine learning Supervised and Unsupervised Learning M		
Regressio fitting and UNIT 3 Data Prod indexing	n, Model Visualization, Prediction and Decision Making, Model d Model Selection. cessing and Visualization Data Formatting, Exploratory Data Ana using Pandas. Data Visualization: Basic Visualization Tools, S	Evaluation: Ovaluation: Ovalua	ver-fitting, Unde
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Regressio fitting and UNIT 3 Data Provindexing Seaborn C S. No. 1. 2. 3. 4.	<ul> <li>m, Model Visualization, Prediction and Decision Making, Model Model Selection.</li> <li>cessing and Visualization Data Formatting, Exploratory Data Anausing Pandas. Data Visualization: Basic Visualization Tools, Screating and Plotting Maps.</li> <li>List of Experiments</li> <li>Write a program to Implement Text Pre-processing with TF-IDF</li> <li>Write a program to Implement Linear and Logistics regression</li> <li>Write a program to Implement Decision Tree Classification</li> </ul>	Evaluation: Ovaluation: Ovalua	ver-fitting, Under 9 g and hierarchic sualization Too
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Regressio fitting and UNIT 3 Data Proc indexing	n, Model Visualization, Prediction and Decision Making, Model Model Selection. cessing and Visualization Data Formatting, Exploratory Data Ana using Pandas. Data Visualization: Basic Visualization Tools, S Creating and Plotting Maps. List of Experiments Write a program to Implement Text Pre-processing with TF-IDF Write a program to Implement Linear and Logistics regression Write a program to Implement Decision Tree Classification Write a program to Implement Naïve Bayes Classification Write a program to Implement Principal Component Analysis	Evaluation: Ovaluation: Ovalua	ver-fitting, Under 9 g and hierarchic sualization Too

### **Text Books:**

1. E. Balagurusamy, "Introduction to Computing and Problem-Solving using Python ", McGraw-Hill Education (India) Private Limited, 1st edition (2017).

2. Thomas Nield, "Essential Math for Data Science", O'Reilly Media (2022).

#### **References:**

1. Fabio Nelli," Python Data Analytics", A press, Second Edition.

2. H. P. Langtangen, "A Primer on Scientific Programming with Python", Second edition, Springer, 2016.

**3.** Ashok Namdev Kamthane, , Amit Ashok Kamthane, "Programming and Problem Solving with Python", McGraw-Hill Education (India) Private Limited, Second edition (2017).

Website and e-Learning Source

1. https://www.packtpub.com/product/python-data-analytics-and-visualization/9781788290098

2. https://youtu.be/oCoQm7Ro_ME

3. <u>https://in.docs.wps.com/module/common/loadPlatform/?sid=sIFmo8KshhLiAoAY</u>

				CO	s VS PO	Os					
	<b>PO 1</b>	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PSO1	PSO2
CO 1	3	3	2	0	1	3	3	3	3	3	0
CO 1	3	3	2	0	1	3	3	3	3	3	0
CO 2	3	3	2	0	1	3	3	3	3	3	0
CO 2	3	3	2	0	1	3	3	3	3	3	0
CO 3	3	3	2	0	1	3	3	3	3	3	0
TOTAL	15	15	10	0	5	15	15	15	15	15	0
SCALED VALUE	3	3	2	0	1	3	3	3	3	3	0
0 - No Relation 1 -	Low Re	lation '	2. Medi	ium Re	lation	3. High	Relatio	n			

0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation

1-5→1, 6-10→2, 11-15→3

C	ourse Nan	ne	TOPOLOGY	$\mathbf{L}$	Т	Р	С
C	Course Code YMA301		YMA301	4	1	0	5
С	Р	Α		L	Т	Р	Η
5	0	0		4	1	0	5
PRERE	QUISITE		Basic knowledge of set theory, and its operation	ons			
Objectiv	bjective:						

		COL	URSE OUTCOMI	ES		DOMAIN	LE	VEL			
CO 1		definitionsof	ncept of topolo opensets,neighborh fordefiningtopologi	ood,interi		Cognitive	Remer	nbering			
CO 2	ofcor	onstrate ntinuity,comp gicalpropertie	the actness,connectedr s.	iess,home	concepts omorphismandto	Cognitive	Unders	standing			
CO 3	Dem	onstrate the	concept of connecto	edness and	d components.	Cognitive	Unders	standing			
CO 4	-	ExplainCognitiveUnderstnotforagivenCognitiveUnderstIllustratethe concepts of separation axioms and its theorems.CognitiveUnderst									
CO 5	Illus	trate the cond	cepts of separation	axioms an	d its theorems.	Cognitive	Unders	standing			
UNIT I	Topo	logical spaces	5					12 + 3			
Topolog				order top	ology – The product	t topology on	X x Y – 7				
subspac	e topolog	gy – Closed se	ets and limit points								
UNIT 2	Conti	nuous functi	ons					12 + 3			
Continu	ous func	tions – The p	roduct topology – 7	The metric	c topology - The Qu	otient topolo	gy.				
UNIT 3	-	ectedness	1 00		1 00 (	1	0,	12 +			
Connect			subspaces of the R	Real line –	Components and lo	ocal connecte	dness.				
UNIT 4	_	actness						12 +			
	-		henaces of the Rea	l line _ L	imit Point Compact	ness – Local	Compacta				
UNIT 5	_	-	Separation Axiom		linit I oliti Compact	lless Local	Compactin	12 + 3			
		-	_								
		•	-		Normal spaces -	The Urysoh	n's Lemm	a – Th			
			m – The Tietz exter					1			
LEC	CTURE	60	TUTORIAL	15	PRACTICAL	0	ΓΟΤΑL	75			
Text Bo James H Indian F	R. Munk	res, Topolog	y (2 nd Edition) Pe	arson Edu	acation Pve. Ltd., 1	Delhi-2002(1	`hird				
	Unit	Chapter	Sections								
	Ι	2	Sections2.1 – 2.6	5							
	II	2	Sections2.7–2.9								
	III	3	Sections3.1–3.4								
	IV	3 4	Sections3.5–3.8								
	V		Sections4.1-4.4								

- 1. J.Dugundji,Topology,Prentice HallofIndia,NewDelhi,1975.
- 2. George F.Sinmons, Introduction to Topology and Modern Analysis, McGrawHillBook Co., 1963
- 3. J.L. Kelly, General Topology, VanNostrand, ReinholdCo., NewYork (2018)
- 4. L.Steen and J.Subhash, Counter Examples in Topology, Holt, Rinehart and Winston, New York, 1970.
- 5. S.Willard, General Topology, Addison-Wesley, Mass., 1970

## Website and e-Learning Source

- 1. <u>http://mathforum.org</u>,
- 2. http://ocw.mit.edu/ocwweb/Mathematics,
- 3. http://www.opensource.org,
- 4. <u>http://en.wikipedia.org</u>

## COs VS POs

	<b>PO 1</b>	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PSO1	PSO2
CO 1	2	1	0	0	0	1	1	1	2	1	0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	2	1	0	0	2	2	2	3	2	0
CO 4	3	2	1	0	0	2	2	2	3	2	0
CO 5	3	2	1	0	0	2	2	2	3	2	0
TOTAL	14	9	4	0	0	9	9	9	13	9	0
SCALED VALUE	3	2	1	0	0	2	2	2	3	2	0

0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation

## 1-5→1, 6-10→2, 11-15→3

С	ourse Nar	ne	MEASURE THEORY AND INTEGRATION	4 1	Т	Р	C
C	ourse Coo	de	YMA302 4 1		0	5	
С	Р	Α		L	Т	Р	Η
5	0	0		4	1	0	5
PRERE	QUISITE		KnowledgeinAnalysis				
Objectiv	e:						

1.To generalize the concept of integration using measures.

		COURS	E OUTCOME	S		DOMAIN	N L	EVEL					
CO 1	<b>Define</b> the	e concept of L	ebesgue measur	re, Measu	rable functions.	Cognitive	e Rem	embering					
CO 2		ratethe conce	pt of series of	integratio	on, Riemann and	Cognitive	e Unde	erstanding					
CO 3	Summari	ze the measur	es and integration	on of mea	sures.	Cognitive	e Unde	erstanding					
CO 4	Explain th	he concept of	convergence and	d product	measure.	Cognitive	e Unde	erstanding					
CO 5	Illustrate spaces.	the concepts	of completeness	s and app	roximation in LP	Cognitive	e Unde	erstanding					
UNIT I	Measure	re on Real line neasure - Measurable sets - Regularity - Measurable function - Borel											
	e outer me		surable sets - ]	Regularit	y - Measurable f	unction - H	Borel and	<u>12 + 3</u> Lebesgu					
UNIT 2	Integratio		ative functions					12 + 3					
The Gen	eral integral	- Integration	of series - Riem	ann and l	Lebesgue integrals.								
UNIT 3		Measure spa						12 + 3					
		measures - (	Completion of r	measures	- Measure spaces	- Integratio	on with re	espect to					
measure.		ence in Measu						12 + 3					
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Almost u Measura UNIT 5 LP space	uniform con bility in a Pr The Class es – Minkow TURE	vergence- Sig roduct space – sical Banach s vski and Holde	- The product M <b>spaces</b> er's inequality –	leasure ar	nd Fubini's Theorem eness – Approxima	n. ation in LP s	spaces.	tion – 12 + 3					
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Almost u Measura UNIT 5 LP space LEC Text Bo H. L. Ro	uniform con bility in a Pr The Class es – Minkow CTURE ok:	vergence- Sig roduct space – sical Banach /ski and Holde 60 Analysis, 3rd	- The product M <b>spaces</b> er's inequality – <b>TUTORIAL</b> Edition, PHI Lto	Complet	nd Fubini's Theorem eness – Approxima <b>PRACTICAL</b>	n. ation in LP s	spaces.	tion – 12 + 3					
Almost u Measura UNIT 5 LP space LEC Text Bo H. L. Ro UNIT –	uniform con bility in a Pr The Class es – Minkow CTURE ok: ok: oyden, Real A	vergence- Sig roduct space – sical Banach /ski and Holdo 60 Analysis, 3rd 2 : Sec 2.1 to 2.3	- The product M spaces er's inequality – TUTORIAL Edition, PHI Lto 5 of (1)	Complet	nd Fubini's Theorem eness – Approxima <b>PRACTICAL</b>	n. ation in LP s	spaces.	tion – 12 + 3					
Almost u Measura UNIT 5 LP space LEC Text Bo H. L. Ro UNIT –	uniform con bility in a Pr The Class es – Minkow CTURE ok: ok: oyden, Real A	vergence- Sig roduct space – sical Banach /ski and Holde 60 Analysis, 3rd	- The product M spaces er's inequality – TUTORIAL Edition, PHI Lto 5 of (1)	Complet	nd Fubini's Theorem eness – Approxima <b>PRACTICAL</b>	n. ation in LP s	spaces.	tion – 12 + 3					
Almost u Measura UNIT 5 LP space LEC Fext Bo H. L. Ro UNIT – UNIT – UNIT –	uniform con bility in a Pr The Class es – Minkow CTURE ok: ok: J Chapter II: II Chapter II: III Chapter II	vergence- Sig roduct space – sical Banach s /ski and Holde 60 Analysis, 3rd 1 : Sec 2.1 to 2.1 II: Sec 3.1 to 3	- The product M <b>spaces</b> er's inequality – <b>TUTORIAL</b> Edition, PHI Lto 5 of (1) 3.4 of (1) 5.6 of (1)	easure ar Complet 15 d. (1988).	nd Fubini's Theorem eness – Approxima PRACTICAL	n. ation in LP s	spaces.	tion – 12 + 3					
Almost u Measura UNIT 5 LP space LEC Text Bo H. L. Ro UNIT – UNIT – UNIT –	uniform con bility in a Pr The Class es – Minkow TURE ok: ok: I Chapter II II Chapter II III Chapter I IV Chapter	vergence- Sig roduct space – sical Banach /ski and Holde 60 Analysis, 3rd 1 : Sec 2.1 to 2.2 II: Sec 3.1 to 2 V: Sec 5.1 to 2 VIII: Sec 7.1, 7	- The product M <b>spaces</b> er's inequality – <b>TUTORIAL</b> Edition, PHI Lto 5 of (1) 3.4 of (1) 5.6 of (1) 7.2 Chapter VIII	easure ar Complet 15 d. (1988).	nd Fubini's Theorem eness – Approxima <b>PRACTICAL</b>	n. ation in LP s	spaces.	tion – 12 + 3					
Almost u Measura UNIT 5 LP space LEC Text Bo H. L. Ro UNIT – UNIT – UNIT –	uniform com bility in a Pr The Class es – Minkow TURE ok: ok: I Chapter II: II Chapter II: III Chapter II: IV Chapter V V Chapter V	vergence- Sig roduct space – sical Banach s /ski and Holde 60 Analysis, 3rd 1 : Sec 2.1 to 2.1 II: Sec 3.1 to 3	- The product M <b>spaces</b> er's inequality – <b>TUTORIAL</b> Edition, PHI Lto 5 of (1) 3.4 of (1) 5.6 of (1) 7.2 Chapter VIII	easure ar Complet 15 d. (1988).	nd Fubini's Theorem eness – Approxima PRACTICAL	n. ation in LP s	spaces.	tion – 12 + 3					

1.G. De Barra, Measure Theory and Integration, New age international (p) Limited.

2.M.E. Munroe, Measure and Integration, by Addison - Wesley Publishing Company, Second Edition, 1971. 3. P.K. Jain, V.P. Gupta, Lebesgue Measure and Integration, New Age International Pvt Limited Publishers, New Delhi, 1986, Reprint 2000.

4. Richard L. Wheeden and Antoni Zygmund, Measure and Integral: An Introduction to Real Analysis, Marcel Dekker Inc. 1977

5. Inder, K. Rana, An Introduction to Measure and Integration, Narosa Publishing House, New Delhi, 1997.

### Website and e-Learning Source

1. <u>https://www.youtube.com/watch?v=83S48Fs9WhY</u>

2. https://archive.nptel.ac.in/courses/103/106/103106118/

				CO	s VS P	0S					
	PO 1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PSO1	PSO2
CO 1	2	1	0	0	0	1	1	1	2	1	0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	2	1	0	0	2	2	2	3	2	0
CO 4	3	2	1	0	0	2	2	2	3	2	0
CO 5	3	2	1	0	0	2	2	2	3	2	0
TOTAL	14	9	4	0	0	9	9	9	14	9	0
SCALED VALUE	3	2	1	0	0	2	2	2	3	2	0

0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation

 $1 \text{-} 5 \rightarrow 1, 6 \text{-} 10 \rightarrow 2, 11 \text{-} 15 \rightarrow 3$ 

-	ourse Nan ourse Cod	-	FUNCTIONAL ANALYSIS YMA303	L 4	T 1	P 0	C 5
С	Р	Α		L	Т	Р	Н
5	0	0		4	1	0	5
PRERE	QUISITE		Linearspaces-Bases-Lineartransformation	S	a	nd	
			Metricspaces–Completeness–Compactness	<u>s</u> —			
			Continuousfunctions.				

## **Objective:**

- 1. To introduce Banach spaces and Hilbert spaces– To study fundamental theorems of functional analysis that includes Hahn Banach theorem, Open mapping theorem and Uniform boundedness principle.
- 2. To introduce operator theory and Banach algebras leading to the spectral theory of operators.

	COURSE OUTCOMES	DOMAIN	LEVEL
CO 1	<b>Define</b> the concept of Normal spaces, properties and theorems.	Cognitive	Remembering
CO 2	<b>Demonstrate</b> the concept of convergence, uniform boundedness and theorems.	Cognitive	Understanding
CO 3	Explain the concepts of Hilbert space and its properties	Cognitive	Understanding
CO 4	<b>Summarize</b> the concept of Normal and Unitary operators and the difference between operators.	Cognitive	Understanding
CO 5	Illustrate the concept of Banach Algebras.	Cognitive	Understanding
UNIT I	NORMED SPACES		12 + 3
		D' 1	Carting
Normed	spaces - Banach spaces and further properties - Heine-Borel theorem	- Riesz lemma	i – Continuous
linear tra	nsformation – Hahn Banach theorem and its consequences.	- Riesz lemma	I – Continuous
linear tra UNIT 2	nsformation – Hahn Banach theorem and its consequences. FUNDAMENTAL THEOREMS		12 + 3
linear tra UNIT 2 Dual spa in N** -	nsformation – Hahn Banach theorem and its consequences. FUNDAMENTAL THEOREMS ces - Dual of some well known spaces – Strong and weak convergence Uniform boundedness principle – Open mapping theorem – Closed	ce - The natura	$\frac{12+3}{1 \text{ embedding of }}$
linear tra UNIT 2 Dual spa in N** - conjugate	nsformation – Hahn Banach theorem and its consequences. <b>FUNDAMENTAL THEOREMS</b> ces - Dual of some well known spaces – Strong and weak convergence	ce - The natura	$\frac{12+3}{1 \text{ embedding of } 1}$
linear tra UNIT 2 Dual spatin N** - conjugate UNIT 3 Hilbert sp sequence	nsformation – Hahn Banach theorem and its consequences. FUNDAMENTAL THEOREMS ces - Dual of some well known spaces – Strong and weak convergence Uniform boundedness principle – Open mapping theorem – Closed e of an operator.	ce - The natura graph theorem t sums – Ortho	12 + 3 1 embedding of 1 1 - The $12 + 3$ normal sets and
linear tra UNIT 2 Dual spatin N** - conjugate UNIT 3 Hilbert sp sequence	<ul> <li>Instruction – Hahn Banach theorem and its consequences.</li> <li>FUNDAMENTAL THEOREMS</li> <li>ces - Dual of some well known spaces – Strong and weak convergence</li> <li>Uniform boundedness principle – Open mapping theorem – Closed ge of an operator.</li> <li>HILBERT SPACES</li> <li>pace: Definition and properties – Orthogonal complements and directors – Series related to orthonormal sets and sequences – Maximal orthorem</li> </ul>	ce - The natura graph theorem t sums – Ortho	12 + 3 1 embedding of 1 1 - The $12 + 3$ normal sets and
linear tra UNIT 2 Dual spa in N** - conjugate UNIT 3 Hilbert sp sequence Projectio UNIT 4 The adjo	<ul> <li>Instruction – Hahn Banach theorem and its consequences.</li> <li>FUNDAMENTAL THEOREMS</li> <li>ces - Dual of some well known spaces – Strong and weak convergend Uniform boundedness principle – Open mapping theorem – Closed ge of an operator.</li> <li>HILBERT SPACES</li> <li>pace: Definition and properties – Orthogonal complements and direct s – Series related to orthonormal sets and sequences – Maximal orth n theorem – Representation of functionals on Hilbert spaces.</li> </ul>	ce - The natura graph theorem t sums – Ortho onormal sets tors – Projectio	12 + 3 $1  embedding of $ $1 -  The$ $12 + 3$ normal sets and and sequences - $12 + 3$
linear tra UNIT 2 Dual spa in N** - conjugate UNIT 3 Hilbert sp sequence Projectio UNIT 4 The adjo	<ul> <li>Insformation – Hahn Banach theorem and its consequences.</li> <li>FUNDAMENTAL THEOREMS</li> <li>ces - Dual of some well known spaces – Strong and weak convergend Uniform boundedness principle – Open mapping theorem – Closed ge of an operator.</li> <li>HILBERT SPACES</li> <li>pace: Definition and properties – Orthogonal complements and direct as – Series related to orthonormal sets and sequences – Maximal orth n theorem – Representation of functionals on Hilbert spaces.</li> <li>OPERATORS ON HILBERT SPACES</li> <li>int of an operator – Self adjoint operator - Normal and Unitary operation of bounded operator - Spectral theorem for normal and self-adjoint operator</li> </ul>	ce - The natura graph theorem t sums – Ortho onormal sets tors – Projectio	12 + 3 $1  embedding of $ $1 -  The$ $12 + 3$ normal sets and and sequences - $12 + 3$

LE	CTURE	60	TUTORIAL	15	PRACTICAL	0	TOTAL	75
Text B	ook:							
1.	G. F. Sim	nons, Introd	uction to Topolog	y and M	odern Analysis, Tata	n McGra	w-Hill, 1963.	
Refere	nces:							
1.		ig Introdu	ctorvFunctional	Analysi	swithApplication	s.John'	Wiley&so	
	ns,1978.	15,1111044		inary s.	is when ipplication	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	, ne jezse	
2.	,	anandLaw	renceNarici.Fu	nctiona	lAnalysis,DoverP	ublicat	ions,2000.	
3.					unctionalAnalysis			
		Delhi,198			5			
4.	A.E.Tay	lorandD.C	Lay,Introducti	ontoFu	inctionalAnalysis	,secon	dedition,	
	JohnWil	ey&Sons,	1980.		-			
5.		as,LinearA	•					
		•		•	Press(Indianedition			
6.		aye,Functi	onalAnalysis,Re	evisedT	hirdEdition,NewA	AgeInte	ernational,	
	2017.			_				
7.			inctionalAnalys					
0		,	iceHallofIndia,2					
8.	S. Ponn			of Fur	nctional Analys	lS,		
0		0	ouse,2002.	Maaria	a Ll'a du ata a Da alv	A ~ ~ ~ ~ ~	· NavyDal	
9.	5.Kesava hi,2009.	in,Function	ialAnalysis, I KI	Mserie	s,HindustanBook.	Agency	,NewDel	
10.	· ·	Rhatia I ac	tureconFunction	nalAna	lysis,TRIMseries,	Hindua	stanBook	
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Websit	e and e-Lear							
	://mathforum	0						
			Mathematics,					
	://www.open		viamematics,					
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COs VS POs											
	PO 1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PSO1	PSO2
CO 1	2	1	0	0	0	1	1	1	2	1	0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	2	1	0	0	2	2	2	3	2	0
CO 4	3	2	1	0	0	2	2	2	3	2	0

CO 5	3	2	1	0	0	2	2	2	3	2	0
TOTAL	14	9	4	0	0	9	9	9	14	9	0
SCALED VALUE	3	2	1	0	0	2	2	2	3	2	0
0 - No Relation, 1 – 2	0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation										

1-5→1, 6-10→2, 11-15→3

C	ourse Nan	ne	DIFFERENTIAL GEOMETRY	L	Т	Р	С
0	Course Cod	le	<b>YMA304</b>	4	1	0	5
С	Р	Α		L	Т	Р	Н
5	0	0		4	1	0	5
PRERE	QUISITE		Basic knowledge about Multivariable Calculus a	nd Linea	r Algebi	ra.	

### **Objective:**

This course gives students basic knowledge of classical differential geometry of curves and surfaces such as the catenary, the tractrix, the cycloid and the surfaces of constant Gaussian curvature and minimal surfaces.

	COURSE OUTCOMES	DOMAIN	LEVEL
CO 1	<b>Define</b> the concept of curvature, torsion and involute.	Cognitive	Remembering
CO 2	Explain the concept of helicoids and isometric correspondence.	Cognitive	Understanding
CO 3	Explain the Normal property of geodesics, Gaussian curvature.	Cognitive	Understanding
<b>CO 4</b>	<b>Summarize</b> the concept of lines of curvature and space curves.	Cognitive	Understanding
CO 5	<b>Illustrate</b> the concept of Compact surfaces and their characterization.	Cognitive	Understanding
UNIT I	Space curves		12 + 3
Definition	n of a space curve – Arc length – Tangent – Normal and binormal –	Curvature and	torsion – Contact
between o	curves and surfaces – Tangent surface – Involutes and evolutes – Int	rinsic equation	ns – Fundamental
existence	theorem for space curves – Helics.		
UNIT 2	Intrinsic properties of a surface		12 + 3
Definition	n of a surface – Curves on a surface – Surface of revolution – Helico	ids – Metric –	Direction
coefficien	nts - Families of curves - Isometric correspondence - Intrinsic prope	erties.	
UNIT 3	GEODESICS		12 + 3
	s – Canonical geodesic equations – Normal property of geodesics – Geodesics curvature- Gauss- Bonnet Theorem – Gaussian cu		

curvature.

#### **UNIT 4** | Non-intrinsic properties of a surface 12 + 3The second fundamental form - Principal curvature - Lines of curvature - Developable - Developable associated with space curves and with curves on surface - Minimal surfaces - Ruled surfaces. **UNIT 5** | Differential geometry of surfaces 12 + 3Compact surfaces whose points are umblics - Hilbert's lemma - Compact surface of constant curvature -Complete surface and their characterization – Hilbert's Theorem – Conjugate points on geodesics. LECTURE 60 TUTORIAL 15 PRACTICAL 0 TOTAL 75 **Text Book:** T.J. Willmore, An Introduction to Differential Geometry, Oxford UniversityPress, (17thImpression) NewDelhi 2002.(Indian Print) Sections Unit Chapter Sections1 to 9. Ι Ι II Π Sections1 to 9. Ш Π Sections10 to 17. IV III Sections1 to 8. V IV Sections1 to 8. **References:** Struik, D.T.Lectures on Classical Differential Geometry, Addison-1. Wesley, Mass. 1950. 2. Kobayashi.S.andNomizu.K.FoundationsofDifferentialGeometry,IntersciencePublish ers,1963. Wilhelm Klingenberg: A course in Differential Geometry, Graduate Texts 3. inMathematics, Springer-Verlag1978. J.A. Thorpe Elementary topics in Differential Geometry, Under- graduate Texts 4. inMathematics, Springer-Verlag1979. Website and e-Learning Source http://mathforum.org,http://ocw.mit.edu/oc wweb/Mathematics, http://www.opensource.org,www.physicsf orum.com **COs VS POs PO 1 PO2** PO3 **PO4 PO5 PO6 PO7 PO8 PO9 PSO1** PSO₂

CO 1	2	1	0	0	0	1	1	1	2	1	0
CO 2	3	2	1	0	0	2	2	2	3	2	0
CO 3	3	2	1	0	0	2	2	2	3	2	0
CO 4	3	2	1	0	0	2	2	2	3	2	0
CO 5	3	2	1	0	0	2	2	2	3	2	0
TOTAL	14	9	4	0	0	9	9	9	14	9	0
SCALED VALUE	3	2	1	0	0	2	2	2	3	2	0

 $1 - 5 \rightarrow 1, 6 - 10 \rightarrow 2, 11 - 15 \rightarrow 3$ 

C	ourse Name	MATHEMATICS OF FINANCE AND	L	T P	C
<u> </u>	Codo	INSURANCE VMA 205	2	1 0	4
C	Course Code	YMA305	3 L	1 0 T P	H H
4 4			3	$1 \qquad 1 \qquad 1 \qquad 1 \qquad 1 \qquad 0$	4
-	QUISITE	The objective of the course is to educate the ba	÷	<b>-</b> v	-
		insurance and banking.		8	
Motion a Risk and	s is on mathematica as a Limit of Simpler Conditional Value a	I theory and modelling, drawing from the discipli Models, Relations between Interest Rates and Pa at Risk and to develop models for Stochastic Order riod Binomial Models.	resent Value A	Analysis, V	alue at
	CO	URSE OUTCOMES	DOMAIN	LEV	VEL
CO 1		Motion and Geometric Brownian Motion and esent value analysis.	Cognitive	Remen	nbering
CO 2		pt of the arbitrage theorem and the black-	Cognitive	App	lying
CO 3	Analyze the value	at risk and conditional value at risk	Cognitive	Anal	yzing
CO 4	Explain the stoch	astic order relations.	Cognitive	Unders	tanding
CO 5	<b>Compare</b> the condition binomial models.	cept of monte carlo simulation and multiperiod	Cognitive	App	lying
UNIT I					9+3
Simpler The Max	Models - Geometric Simum Variable - Th	<b>metric Brownian Motion:</b> Brownian Motion - B Brownian Motion - Geometric Brownian Motion e Cameron-Martin Theorem. <b>Interest Rates and</b> e Analysis - Rate of Return - Continuously Varyi	as a Limit of <b>Present Val</b>	f Simpler N <b>ue Analys</b>	/lodels
					9+3
UNIT 2				oof of the	
The Arb Arbitrage the Black	e Theorem. <b>The Bla</b> k–Scholes Option Co	he Arbitrage Theorem - The Multiperiod Binomia <b>ck–Scholes Formula</b> : Introduction - The Black– ost - The Delta Hedging Arbitrage Strategy - Som Il Derivatives.	Scholes Form	ula - Prop	erties of
The Arb Arbitrage the Black Scholes I	e Theorem. The Bla	<b>ck–Scholes Formula</b> : Introduction - The Black– ost - The Delta Hedging Arbitrage Strategy - Som	Scholes Form	ula - Prop	erties of ck–
The Arb Arbitrage the Black Scholes I UNIT 3	e Theorem. <b>The Bla</b> k–Scholes Option Co Formula - The Partia	<b>ck–Scholes Formula</b> : Introduction - The Black– ost - The Delta Hedging Arbitrage Strategy - Som Il Derivatives.	Scholes Form the Derivations	nula - Prop s - The Bla	erties of ck– 9 + 3
The Arb Arbitrage the Black Scholes I UNIT 3 Valuing	e Theorem. <b>The Bla</b> k–Scholes Option Co Formula - The Partia <b>by Expected Utilit</b>	<ul> <li>ck–Scholes Formula: Introduction - The Black– ost - The Delta Hedging Arbitrage Strategy - Som al Derivatives.</li> <li>y: Limitations of Arbitrage Pricing - Valuing In</li> </ul>	Scholes Form ne Derivations vestments by	nula - Prop s - The Bla Expected	erties of ck– <b>9 + 3</b> Utility
The Arb Arbitrage the Black Scholes I UNIT 3 Valuing The Port	e Theorem. <b>The Bla</b> k–Scholes Option Co Formula - The Partia <b>by Expected Utilit</b> folio Selection Prob	<b>ck–Scholes Formula</b> : Introduction - The Black– ost - The Delta Hedging Arbitrage Strategy - Som al Derivatives. <b>y:</b> Limitations of Arbitrage Pricing - Valuing In lem - Estimating Covariances - Value at Risk and	Scholes Form the Derivations vestments by I Conditional	nula - Prop s - The Bla Expected Value at R	erties of ck– <b>9 + 3</b> Utility
The Arb Arbitrage the Black Scholes I UNIT 3 Valuing The Port	e Theorem. <b>The Bla</b> k–Scholes Option Co Formula - The Partia <b>by Expected Utilit</b> folio Selection Prob	<ul> <li>ck–Scholes Formula: Introduction - The Black– ost - The Delta Hedging Arbitrage Strategy - Som al Derivatives.</li> <li>y: Limitations of Arbitrage Pricing - Valuing In</li> </ul>	Scholes Form the Derivations vestments by I Conditional	nula - Prop s - The Bla Expected Value at R	erties of ck– <b>9 + 3</b> Utility isk -
The Arb Arbitrage the Black Scholes I UNIT 3 Valuing The Port The Capi UNIT 4 Stochast Dominar	e Theorem. <b>The Bla</b> k–Scholes Option Co Formula - The Partia <b>by Expected Utilit</b> folio Selection Prob ital Assets Pricing M <b>tic Order Relations</b> nce - Likelihood Rat	<ul> <li>ck–Scholes Formula: Introduction - The Black– ost - The Delta Hedging Arbitrage Strategy - Som al Derivatives.</li> <li>y: Limitations of Arbitrage Pricing - Valuing In lem - Estimating Covariances - Value at Risk and Iodel - Rates of Return: Single-Period and Geometric First-Order Stochastic Dominance - Using Coup io Ordering - A Single Period Investment Problem</li> </ul>	Scholes Form the Derivations vestments by I Conditional etric Brownia	nula - Prop s - The Bla Expected Value at R in Motion.	erties of ck- 9+3 Utility isk - 9+3 c
The Arb Arbitrage the Black Scholes I UNIT 3 Valuing The Port The Capi UNIT 4 Stochast Dominar	e Theorem. <b>The Bla</b> k–Scholes Option Co Formula - The Partia <b>by Expected Utilit</b> folio Selection Prob ital Assets Pricing M <b>tic Order Relations</b> nce - Likelihood Rat	<ul> <li>ck–Scholes Formula: Introduction - The Black– ost - The Delta Hedging Arbitrage Strategy - Som al Derivatives.</li> <li>y: Limitations of Arbitrage Pricing - Valuing In lem - Estimating Covariances - Value at Risk and Iodel - Rates of Return: Single-Period and Geom</li> <li>: First-Order Stochastic Dominance - Using Coup</li> </ul>	Scholes Form the Derivations vestments by I Conditional etric Brownia	nula - Prop s - The Bla Expected Value at R in Motion.	erties of $ck-$ 9 + 3 Utility isk - 9 + 3

**Exotic Options:** Introduction - Barrier Options - Asian and Lookback Options - Monte Carlo Simulation - Pricing Exotic Options by Simulation - More Efficient Simulation Estimators - Options with Nonlinear Payoffs - Pricing Approximations via Multiperiod Binomial Models - Continuous Time Approximations of Barrier and Lookback Options.

LECTURE	45	TUTORIAL	15	PRACTICAL	0	TOTAL	60

#### **Text Book:**

1.SheldonM.Ross, "AnElementaryIntroductiontoMathematicalFinance", ThirdEdition, Universityof Southern California, CambridgeUniversityPress, 2011.

Unit	Chapter	Sections
Ι	3 & 4	Sections3.1 – 3.5(Pages34–46) & Sections4.1–4.4(Pages48-67)
Π	6&7	Sections6.1 -6.3(Pages92 -101)& Sections7.1 -7.6(Pages106 -127)
III	9	Sections9.1 – 9.6(Pages165–189)
IV	10	Sections10.1–10.5(Pages193 -210)
V	13	Sections13.1 – 13.9(Pages247–262)

#### **References:**

- 1. SalihN.Nettci,AnintroductiontotheMathematicsofFinancialDerivatives,Academic Press, Inc.(1996)
- 2. Robert J.Ellicott and P.Ekkehardkopp, Mathematics of Financial Markets, Springer-Verlag,NewYork
- 3. JohnC.Hull,Options, FuturesandOtherDerivatives,PrenticeHallofIndiaPrivateLimited

#### Website and e-Learning Source

- 1. https://archive.nptel.ac.in/courses/111/103/111103126/
- 2. https://www.youtube.com/watch?v=CffjpwKc_X4
- 3. https://www.youtube.com/watch?v=lzMQ3hZqtp0

				CO	s VS P	Us					
	PO 1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PSO1	PSO2
CO 1	2	1	0	0	0	1	1	1	2	1	0
CO 2	3	3	2	0	1	3	3	3	3	3	0
CO 3	3	3	3	1	2	3	3	3	3	3	1
CO 4	3	2	1	0	0	2	2	2	3	2	0
CO 5	3	3	2	0	1	3	3	3	3	3	0
TOTAL	14	12	8	1	4	12	12	12	14	12	1

CO- VC DO-

SCALEI	O VALUE	3	3	2	1	1	3	3	3	3	3	1
0 - No R	elation, 1 –	Low Re	lation, 2	2- Med	ium Re	lation,	3- High	Relati	on			
1-5→1, 6	5-10→2, 11-	15→3										
C	ourse Name	<b>)</b>		I	LUID	DYNA	MICS			L	T   ]	P C
С	ourse Code					IA3E1				3	1	0 4
<u>C</u> 4	P 0	<u>A</u> 0								L 3		P H 0 4
-	QUISITE	U		knowle calculu	-	o know	calculu	s up to	partial d	ifferentia	_	-
Objectiv	e:		vector	calcult	10							
•	To establish To make st To build th	udents u	ndersta	nd the i	mportai	nce of f	luid dyn	amics i	n diverse	e real-life	e applica	tions
		CO	URSE (	OUTCO	OMES				DC	MAIN	L	EVEL
CO 1	Explain B	ernoulli	's theore	em , equ	ation o	f contin	uity.		Co	gnitive	Rem	embering
CO 2	Explain th	e concej	ot of Eul	er's ec	luation	, Kelvir	's theor	em.	Co	gnitive	Ap	oplying
CO 3	Explain th	e circle	theorem	, Blasiı	us's the	orem-li	ft force.		Co	gnitive	An	alyzing
CO 4	<b>Explain</b> th distribution	-	e equati	on and	demons	strate pr	essure		Co	gnitive	Unde	erstanding
CO 5	Explain the plane Poise			r-Stoke	es equat	ions an	d Couet	te and	Co	gnitive	Ap	oplying
UNIT I	Introducto	ory idea	S									9 + 3
body - Be	s like veloci ernoulli's the conditions	eorem -	differen	tiation	w.r.to ti	me - eq	-					
	Inviscid th											9 + 3
	equation - c											
	uation - rate <b>Two-dime</b>			rculatio	on – Ke	ivin's tl	heorem ·	- vortex	motion	and its p	ermanen	$\frac{1}{9+3}$
Example: doublet a	s – stream f and vortex - on – Blasius'	unction mixed	and velo flow - 1	nethod								ies source
UNIT 4					ension	5						9 + 3

Laplace equation – spherical harmonics – axially symmetric field – Stoke's stream function – motion of a sphere – pressure distribution – drag force – axial distributions of sources and doublets – continuous distributions – flow near axis due to sources and doublets. **UNIT 5** Viscous theory 9+3The Navier-Stokes equations - vorticity and circulation in a viscous fluid - some exact solutions - steady flow through an arbitrary cylinder with pressure - steady Couette flow between cylinders in relative motion - steady flow between parallel planes - Couette and plane Poiseuille flow. LECTURE TUTORIAL PRACTICAL TOTAL **Text Book:** 1. F. Chorlton, Textbook of Fluid Dynamics, CBS Publishers, New Delhi, 2004 **References:** 1. L.M. Milne Thomson, Theoretical Hydrodynamics, Dover, 1996. 2. N. Curle and H.J. Davies. Modern Fluid Dynamics, D Van Nostrand Company Ltd., London, 1968. 3. S.W. Yuan, Foundations of Fluid Mechanics, Prentice- Hall of India, New Delhi, 1988. 4. .A.J. Chorin and A. Marsden, A Mathematical Introduction to Fluid Dynamics, Springer-Verlag, New York, 1993. Website and e-Learning Source - http://nptel.ac.in **COs VS POs PO 1 PO2 PO4 PO6** PSO₂ PO3 **PO5 PO7 PO8 PO9** PSO1 **CO1 CO 2 CO 3 CO 4 CO 5** TOTAL **SCALED VALUE** 0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation

# $1 ext{-}5 ext{-}1, 6 ext{-}10 ext{-}2, 11 ext{-}15 ext{-}3$

-	ourse Nar course Coo		PROBABILITY THEORY YMA3E1B	L 3	T 1	P 0	C 4
C	Р	Α		L	Т	Р	Н
4	0	0		3	1	0	4
PRERE	OUISITE		Basic concept of Algebra and Calculus				

## **Objective:**

To introduce axiomatic approach to probability theory, to study some statistical characteristics, discrete and continuous distribution functions and their properties, characteristic function and basic limit theorems of probability.

	COURSE OUTCOMES	DOMAIN	LEVEL
CO 1	<b>Define</b> distribution Function, joint distribution function, Conditional Distribution function to solve functions on random variables.	Cognitive	Remembering
CO 2	<b>Explain</b> Expectation, Moments and Chebyshev Inequality, to solve Regression of the first and second types.	Cognitive	Applying
CO 3	<b>Explain</b> Characteristic functions, to define distribution function, to find probability generating functions.	Cognitive	Analyzing
CO 4	<b>Define</b> one point, two-point, Binomial distributions, to solve problems of hypergeometric and Poisson distributions, to define Uniform, normal, gamma, Beta distributions, to solve problems on Cauchy and Laplace distributions.	Cognitive	Understanding
CO 5	<b>Discuss</b> Stochastic convergence, Bernoulli law of large numbers, to elaborate convergence of sequence of distribution functions.	Cognitive	Applying
UNIT I	Random Events and Random Variables	L	9+3
Random	events - Probability axioms - Combinatorial formulae - Conditional	l probability – I	Bayes Theorem –
-	lent events – Random Variables – Distribution Function – Joint Distrional Distribution – Independent random variables – Functions of rar	-	
UNIT 2	Parameters of the Distribution		9+3
Expectat	ion- Moments – The Chebyshev Inequality – Absolute moments – O vectors – Regression of the first and second types.	rder parameter	
	Characteristic functions		9 + 3
Propertie	s of characteristic functions – Characteristic functions and istic function of the sum of the independent random variables by the Characteristic function – Characteristic function of mult	- Determinatio	emi0invariants – on of distribution
function	ty generating functions.		

One point, two-point, Binomial – Polya – Hypergeometric – Poisson (discrete) distributions – Uniform – normal gamma – Beta – Cauchy and Laplace (continuous) distributions.

## UNIT 5 Limit Theorems

**9** + **3** 

Stochastic convergence – Bernaulli law of large numbers – Convergence of sequence of distribution functions – Levy-Cramer Theorems – De Moivre-Laplace Theorem – Poisson, Chebyshev, Khintchine Weak law of large numbers – Lindberg Theorem – Lapunov Theroem – Borel-Cantelli Lemma - Kolmogorov Inequality and Kolmogorov Strong Law of large numbers.

LECTURE 45 TUTORIAL IS PRACTICAL 0 TOTAL 0	LECTURE	45	TUTORIAL	15	PRACTICAL	0	TOTAL	60
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## **Text Book:**

M. Fisz, *Probability Theory and Mathematical Statistics*, John Wiley and Sons, New York, 1963.

UNIT-I- Chapter 1: Sections 1.1 to 1.7 and Chapter 2 : Sections 2.1 to 2.9

UNIT-II - Chapter 3 : Sections 3.1 to 3.8

UNIT-III - Chapter 4 : Sections 4.1 to 4.7

UNIT-IV - Chapter 5 : Section 5.1 to 5.10 (Omit Section 5.11)

UNIT-V - Chapter 6 : Sections 6.1 to 6.4, 6.6 to 6.9, 6.11 and 6.12. (Omit Sections 6.5, 6.10, 6.13 to 6.15) **References:** 

1. R.B. Ash, Real Analysis and Probability, Academic Press, New York, 1972

2. K.L.Chung, A course in Probability, Academic Press, New York, 1974.

4. R.Durrett, *Probability : Theory and Examples*, (2nd Edition) Duxbury Press, New York, 1996.

5. V.K.RohatgiAn Introduction to Probability Theory and Mathematical Statistics, Wiley Eastern Ltd., New Delhi, 1988(3rd Print).

6. S.I.Resnick, A Probability Path, Birhauser, Berlin, 1999.

7. B.R.Bhat, Modern Probability Theory (3rd Edition), New Age International (P)Ltd, New Delhi, 1999

## Website and e-Learning Source

http://mathforum.org, http://ocw.mit.edu/ocwweb/Mathematics,

http://www.opensource.org, http://www.probability.net

COs VS POs											
	PO 1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	РО	PSO1	PSO2
CO 1	2	1	0	0	0	1	1	1	2	1	0
CO 2	3	3	2	0	1	3	3	3	3	3	0
CO 3	3	3	3	1	2	3	3	3	3	3	1
CO 4	3	2	1	0	0	2	2	2	3	2	0
CO 5	3	3	2	0	1	3	3	3	3	3	0
TOTAL	14	12	8	1	4	12	12	12	14	12	1
SCALED VALUE	3	3	2	1	1	3	3	3	3	3	1

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$ 

C	course Nam	ne	ALYSIS OF	L	Т	Р	С		
(	Course Cod	ρ		GORITH MA3E1		3	1	0	4
C	P	A	1		C		T	P	H
4	0	0				3	1	0	4
PRERE	QUISITE		asic knowledge al	oout basi	c knowledge of pro	gramming	and m	athema	
Objectiv	-				<u> </u>	0 0			
		s of this cours	e are to:						
	• Impart (	the knowledg	e of design analy	sis of alg	orithms which is th	ne core of o	comput	erscien	ce.
			c performance of						
	• Demons	strate a famil	iarity with major	algorithr	ns and data structur	es.			
Teach in			gn paradigms and	0					
	1 0		SE OUTCOMES		2	DOMA	IN	LEV	'EL
CO 1	Dofine	loorithm Do	ndomized algorit	ama		Cognitiv	ve l	Remem	bering
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CO 2	Fynlain	Stacks and Q		Cognitiv	Understanding				
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CO 3						Cognitiv	70	Analy	zina
05	Demons	trate the Me	rge sort, Quick so	ort.		Coginti		Anary	Zing
<b>CO 4</b>						Cognitiv	10	Appl	vina
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<u> </u>	Binary tr			ion and '	Madular	Comitie	10	A	
CO 5	arithmet		ion and interpolat	lion and	viodular	Cognitiv	/e	Appl	ying
									0
UNIT I	Introduc		n analification D	antonnor	nce analysis- Rando	mized ala	o mith mo		9+3
what is	an aigoriún	n?- Algoriun	ii specification- P	eriorinai	ice analysis- Rando	mized alg	ortunins		
UNIT 2	Elementa	ary data stru	ctures						9+3
				Dueues- (	Graph representation	ons.			
		f algorithm 1			1 1				9 + 3
				y search	- finding the maxi	mum and	minim		
	lerge sort- (			•	C				
UNIT 4	Design of	f algorithm 1	nethods continua	ation					9 + 3
The Gree	edv method	- The genera	method- Tree ve	rtex Spli	tting Problem- Tre	e traversal	and sea	arch	
					raphs- Breadth firs				earch
-		-	•		tracking- General		-		
			,						
UNIT 5	Algebrai	c problems							9+3
Algebrai	c problems	The general	method_ Evaluat	ion and	Interpolation- The	Fast Fourie	or trane	form_ N	Modular
<u> </u>		<b>U</b>	n and interpolatio			i asi i Uulli	-1 11 alls	101111- I	viouuidi
	TURE	45	TUTORIAL	<u>11.</u> 15	PRACTICAL	0	TOTA		60
		<b>ЭТ</b>		10		U	101/		
		<u> </u>							

## **Text Book:**

1.Fundamentals of Computer Algorithm, Eills Horowitz, SartajShani andSanguthevarRajasekaran,Galgotia PublicationsPvtLtd,2000.

Unit	Chapter	Sections
Ι	1	sections;1.1,1.2, 1.3.1to 1.3.4,1.4.1to1.4.3
II	2	section:2.1to 2.4, 2.6
III	3	sections3.1 to 3.5
	4	sections4.1, 4.3
IV	6	sections6.1 to 6.3
	7	sections7.1, 7.2
	8	sections8.1, 8.3
V	9	sections9.1 to 9.5

#### **References:**

- 1. AhoA.V.,Hopcroft,J.E.andUllman,J.D.:TheDesignandAnalysisofComputerAlgorith ms.AdditorWesleyReading Mass(1974)
- 2. Goodman, S. Eand Hedetniemi, S. T.: Introduction to the design and analysis of algor ithms (McGraw Hillin ternational Edition 1987).

# Website and e-Learning Source

- 1. <u>http://mathforum.org</u>,
- 2. http://ocw.mit.edu/ocwweb/Mathematics,
- 3. http://www.opensource.org,
- 4. <u>www.physicsforum.com</u>

#### **COs VS POs**

<b>PO 1</b>	PO2	PO3	PO4	PO5	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	PO9	PSO1	PSO2
2		1				_				
_	1	0	0	0	1	1	1	2	1	0
3	2	1	0	0	2	2	2	3	2	0
3	3	3	1	2	3	3	3	3	3	1
3	3	2	0	1	3	3	3	3	3	0
3	3	2	0	1	3	3	3	3	3	0
14	12	8	1	4	12	12	12	14	12	1
3	3	2	1	1	3	3	3	3	3	1
	3 3 3 14 3	3     3       3     3       3     3       3     3       14     12       3     3	3     3     3       3     3     2       3     3     2       14     12     8       3     3     2	3 $3$ $3$ $3$ $1$ $3$ $3$ $2$ $0$ $3$ $3$ $2$ $0$ $14$ $12$ $8$ $1$ $3$ $3$ $2$ $1$	3 $3$ $3$ $3$ $1$ $2$ $3$ $3$ $2$ $0$ $1$ $3$ $3$ $2$ $0$ $1$ $3$ $3$ $2$ $0$ $1$ $14$ $12$ $8$ $1$ $4$ $3$ $3$ $2$ $1$ $1$	3 $3$ $3$ $3$ $1$ $2$ $3$ $3$ $3$ $3$ $1$ $2$ $3$ $3$ $3$ $2$ $0$ $1$ $3$ $3$ $3$ $2$ $0$ $1$ $3$ $14$ $12$ $8$ $1$ $4$ $12$ $3$ $3$ $2$ $1$ $1$ $3$	3 $3$ $3$ $1$ $2$ $3$ $3$ $3$ $3$ $3$ $1$ $2$ $3$ $3$ $3$ $3$ $2$ $0$ $1$ $3$ $3$ $3$ $3$ $2$ $0$ $1$ $3$ $3$ $3$ $3$ $2$ $0$ $1$ $3$ $3$ $14$ $12$ $8$ $1$ $4$ $12$ $12$ $3$ $3$ $2$ $1$ $1$ $3$ $3$	3     3     3     1     2     3     3     3       3     3     2     0     1     3     3     3       3     3     2     0     1     3     3     3       3     3     2     0     1     3     3     3       14     12     8     1     4     12     12     12	3 $3$ $3$ $1$ $2$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$	3 $3$ $3$ $1$ $2$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$

## 0 - No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation

 $1 \text{-} 5 \rightarrow 1, 6 \text{-} 10 \rightarrow 2, 11 \text{-} 15 \rightarrow 3$ 

SEMESTER	COURSE CODE	COURSE NAME	L	Т	Р	Н	С
IV	YMA401	PROJECT WORK	0	0	0	30	6
		TOTAL				30	6