FATIMA COLLEGE (AUTONOMOUS)

Re-Accredited with "A" Grade by NAAC (3rd Cycle)

74th Rank in India Ranking 2020 (NIRF) by MHRD

Maryland, Madurai- 625 018, Tamil Nadu, India

NAME OF THE DEPARTMENT: MATHEMATICS

NAME OF THE PROGRAMME : M.Sc. MATHEMATICS

PROGRAMME CODE : PSMA

ACADEMIC YEAR : 2021 - 2022

Minutes of the Board of Studies,
Department of Mathematics
To be implemented from 2021-2022 onwards

Venue : Maths Department
Convened on : 10.04.2021 Convened at : 10.30 am

Members Present : (Names with Initial and Designation)

1	Dr. Pandia Raja Principal Thyagaraja College, Madurai -625009. Mail ID : pandiaraja.d@gmail.com	University Nominee
2	Dr. M. Navaneethakrishnan Associate Professor & Head Department of Mathematics Kamaraj College Thoothukudi -628003 Mail ID : navaneethan65@yahoo.co.in	Subject Expert.
3.	Dr. D. Muthuramakrishnan Dean of Science Head of the Department Department of Mathematics National College Trichy -620001 Mail ID : dmuthuramakrishnan@gmail.com	Subject Expert.

4.	Ms. S. Sindhuja Senior Statistical Officer National Statistical office(FOD) Ministry of Statistics and Programme implementation B wing 2nd Floor, Shastri Bhavan Haddows Road Nungambakkam, Chennai-600006	Industrialist.
5.	Dr.K.P.V. Preethi Assistant Professor Department of Mathematics Saiva Bhanu kshatriya College Aruppukottai -626101 Mail ID: vpreethi90@yahoo.com.	Alumna
6.	Mrs. A. Paulin Mary	Head of the Dept.
7.	1. Mrs. A. Sheela Roselin 2. Dr. Sr. M. Fatima Mary 3. Dr. C. Prasanna Devi 4. Dr. E. Helena 5. Mrs. Nigila Ragavan 6. Mrs. M. Teresa Nirmala 7. Dr. V. Vanitha. 8. Mrs. R. Jenovi Rosary Deepa 9. Mrs. B. Vethamary Jacquline 10. Mrs. J. Annal Mercy 11. Dr. K. Anutha. 12. Dr. M. Rasi.	Staff Members

Minutes of the Board of Studies.

1. Presentation of the Action Taken Report.

Action Taken Report for 2020-2021-UG.

S.No	Common Suggestions Offered in the Previous Board.	Action Taken For the Academic Year 2020-21
1.	The Board approved 10% Self Study Components for all UG Papers	The approved 10% Self Study Components for all UG papers was incorporated in the Syllabus.
2.	The Board passed the Syllabi for new Self-learning Course, "History of Mathematics" (19UGSLM1) for advanced learners of III UG.	The Syllabi is passed by the Board for new Self-learning Course, "History of Mathematics (19UGSLM1) for advanced learners of III UG was implemented.

Action Taken Report for 2020-2021 PG.

S.No.	Common Suggestions offered in the Previous Board	Action Taken for the Academic year 2020-21
1.	The Board approved 20% Self Study Component for all PG Papers.	The approved 20% Self Study Components for all PG papers was incorporated in the Syllabus.
2.	The Board passed the Syllabus for new Self learning Course, "Problems	The Syllabus passed by the Board for new Self learning Course, "Problems

in 'Advanced Mathematics' (19PGSLM1) for advanced learners of IIPG.	in Advanced Mathematics" (19PGSLM1) for advanced learners of II PG was implemented.

Change of Course Title – Nil.

S.No	Old Course Code	New Course Code	Old Course Title	New Course Title	Need for change.
–	–	–	–	–	–

New Courses introduced – UG.

S.No	Course Code	Course Title	Relevance To				Scope for			Need for Introduction.
			L	R	N	G	EMP	ENTRE	SD	
1.	19UGSLM1	History of Mathematics				✓	✓			Enable the students to know the origin and development of Mathematics and to know about various Mathematicians

New Courses introduced - PG.

S.No	Course Code	Course Title	Relevance to				Scope for			Need for Introduction
			L	R	N	C	EMP	ENTRE	SD	
1.	19PMSLM1	Problems in Advanced Mathematics			✓		✓			Enable the Students to Solve NET based problems in various branches of Mathematics.

Revised Courses - Nil.

S.No	Course Code	Course Title	Nos Title of Units Revised with the Revised Content	% of the Revision	Need for Revision	Relevance To	Scope for
—	—	—	—	—	—	—	—

2. Updation of open Educational Resources in the list of references of each Course - UC.

S.No	Course Code	Course Title	Details of Updation
1.	19MICC1/19MICC1	Calculus	1. www.tutorialspoint.com 2. www.khanacademy.org.

2.	19M1CC2/19G1CC2	Classical Algebra	http://www.britannica.com
3.	21M1ACP1	Allied Maths-I	www.tutorialspoint.com
4.	19M2CC3/19G2CC3	Differential Eqns	www.geeksforgeeks.org
5.	21M2CC4/21G2CC4	Statistics	Statistics & Probability calculators & workouts .com.
6.	21M2ACP2	Allied Mathematics-II	http://www.britanica.com

Updation of open Educational Resources in the list of References of each Course - PG.

S.No	Course Code	Course Title	Details of Updation.
1.	19PG1M1	Algebra	http://books.google.co.in/books/A text book of Algebra.html
2.	19PG1M2	Real Analysis	http://onlinelibrary.wiley.com
3.	19PG1M4	classical Mechanics	http://www.freebookcentre.net/Physics/Classical Mechanics-books.html
4.	19PG2M5	Advanced Algebra	http://books.google.co.in/books/A text book of Algebra.html
5.	19PG2M6	Advanced Real Analysis	http://onlinelibrary.wiley.com
6.	19PG2M7	Differential Eqns	http://tutorial.mathlamnar.edu/classes/de.aspx

7.	19PA2 MS	Graph Theory	http://nlp.stanford.edu http://www.rs.eth2.ch

3. Revision of Courses – UG. – Nil.

Revision of Courses – PG.

S. No	Course Code	Course Title	No & Title of Units Revised with Revised Content.	% of the Revision	Need for Revision	Relevance To				Scope for		
						L	R	N	A	EMP	ENTRE	SD
1.	19PA3MEI	Fuzzy Sets and its applications	Unit I: CRISP sets and Fuzzy sets: Classical Logic an overview, Fuzzy logic Unit IV Fuzzy Measure Necessity Measures	10% Removed	Based on the feed back from the Students Syllabus is too heavy for 4 hours				✓	✓		

Course Code Changed – PG.

S.No	Old Course Code	New Course Code	Sub. Title
1.	19PA3MEI	21PA3MEI	Fuzzy Sets and its Applications.

4. New Courses Introduced – UG.

S.No	Course Code	Course Title	Relevance To				Scope for			Need for Introduction
			L	R	N	G	EMP	ENTRE	SD	
1.	21UGEM2SC	Mathematics and Economics for Competitive Exams			✓		✓		✓	To enhance employability skills.

New Course introduced – PG.

S.No	Course Code	Course Title	Relevance To				Scope for			Need for Introduction
			L	R	N	G	EMP	ENTRE	SD	
1.	21PGLM2SC	Verbal and Numerical Aptitude for National Examinations			✓		✓		✓	To enhance employability skills.

5. Introduction of Purely Skill-Embedded Certificate/Diploma/Advanced Diploma Value-Added Course other than the Value-Added Course already being Offered.

S.No	Course code	Course Title	Skill Sharpened	Course outcome
1.	21UGVAM1	Verbal and Non-verbal Reasoning	Analytical Reasoning Skills	1-Develop General Mental Ability 2 Apply Analytical Reasoning 3 Understand pattern Completion tricks

6. Rubrics for Internship / Project

S.No	C_1 20 marks	C_2 20 marks	CIA Total 40 marks	External 60 mks.
1.	Follow up after 15 days	Viva-voce after completion	-	

The Board reviewed and approved the following I B.Sc Mathematics and I M.Sc Mathematics Syllabi for I and II Semesters.

UG.

19M1CC1 / 19G1CC1 - Calculus

19M1CC2 / 19G1CC2 - Classical Algebra

21M1ACP1 - Allied Mathematics - I

19M2CC3 / 19G2CC3 - Differential Equations

21M2CC4 / 21G2CC4 - Statistics

21M2ACP2 - Allied Mathematics - II

PG

19PG1M1 - Algebra

19PG1M2 - Real Analysis

19PG1M3 - Number Theory

19PG1M4 - Classical Mechanics

19PG1EDC / 19PG2EDC -

19PG2M5 - Advanced Algebra

19PG2M6 - Advanced Real Analysis

19PG2M7 - Differential Equations

19PG2M8 - Graph Theory.

Computer programming with C and object Oriented Programming with C++ are Shifted from V Semester and VI Semester to I year as Allied papers in I Semester and II Semester & Statistics and Advanced

Stabsbcs will be Shifted from I Semesler and II Semesler to Semesler III and Semesler IV as Major papers. 10% of the Syllabus is reduced in PC-IV Semesler Elective paper "Fuzzy Sets and its applications". The board appuoved the Syllabus for the new Self learning Extra Credit Courses 21UCLM2SL, "Mathemabcs and Economics for Competitive Exams" - Interdisciplinary (offered by Mathemabcs and Economics Dept) which will be introduced in II Semesler for I UG advanced learners and 21PCLM2SL - Verbal and Numerical Aptitude for National Examinations" - Inter-disciplinary (offered by Mathemabcs and English Dept) in II Semesler for I PG Advanced learners. They also appuoved the Syllabus of the new Value added Crash Course 21UCVAM1, 'Verbal and Non verbal Reasoning". The board also appuved the following Allied Courses offered by the Mathemabcs Department (SF) to B.Sc Stabsbcs, BBA, and B.Sc. IT & BCA

B.Sc. Stabsbcs

1. 21C1ACST1 - Calculus
2. 21C2AcST2 - Algebra
3. 21C3AcST3 - Linear Programming
4. 21C4ACST4 - Linear Algebra

BBA

21C2AcU2 - Mathemabcs for Management

BSc - IT & BCA

21G1AC1/21G1ACJ1 - Discrete Mathematics

21G2AC12/21G2ACJ2 - Operation Research.

Other Suggestions:

1. Credit distribution may be in proportion to number of hrs/core/allied/elective
   a. Core paper more teaching hours - more credits.
   b. Allied paper - Comparatively less
   c. Then elective.
2. 10% Self study may be in the application level not in the beginning (Unit I) for PG.
3. At PG Level we should Concentrate on UGC/CSIR/Research, too much weightage is given for library - 10 hrs (3 hr/semester for I PG and 2 hr/semester for II PG) that may be avoided and more papers may be introduced.
4. As we have to support the students to identify Companies/organizations for internship, it is difficult in first year PG, it should not be compulsory
5. offering interdisciplinary papers (EDC) at PG level may dilute the core Curriculum
6. In IV semester, project should be monitored by the staff, working hours may be given
7. Instead of giving internship in first year and Project in II year (PG) students

may be given option. Students those who are interested in getting jobs and pursuing higher studies can do internship and Project respectively

8. For OBE 60% internal, 30% External and 10% Survey, TANSCHE guidelines CIA - 25% and 75% External. Discuss about your 40% CIA and 60% External.

9. For Reference, the latest edition may be given

Name	Signature
1. Mrs. A. Paulin Mary	A. Paulin
2. Dr. Pandia Raja	
3. Dr. M. Navaneethakrishnan	
4. Dr. D. Muthuramakrishnan	
5. Ms. S. Sindhuja	
6. Dr. K.P.V. Preethi	V. Preethi
7. Dr N. Malathi	Malathi
8. Mrs. A. Sheela Roselin	A. Sheela Rosel
9. Dr. Sr. M. Fatima Mary	
10. Dr. C. Prasanna Devi	C. Prasanna

11. Dr. E. Helena	
12. Mrs. Nigila Ragavan	
13. Mrs. M. Teresa Nirmala	M. Teresa Nir
14. Dr. V. Vanitha	V. Van
15. Mrs. R. Jenovi Rosary Deepa	R. Jenovi
16. Mrs. B. Vaithamary Jacqueline	B. Vaithamary
17. Mrs. J. Annal Mercy	J. Annal Mf

10/04/2021

VISION OF THE DEPARTMENT

To empower students both as individuals and as citizens in the society through Mathematics with sound knowledge and investigate new methodologies for future applications.

MISSION OF THE DEPARTMENT

- To achieve high standards of excellence in generating and propagating knowledge in Mathematics
- To lay a solid foundation for the concept of numeracy and scientific thinking
- To give the students, opportunities for developing, manipulative skills that will enable them function effectively in the society within the limits of their capacity
- To contribute to the development of students as Mathematical thinkers and to continue to grow in their chosen professions
- To enable the students to become lifelong learners and to function as productive citizens

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1	Our graduates will be academic, digital and information literates; creative, inquisitive, innovative and committed researchers who would be desirous for the "more" in all aspects
PEO 2	They will be efficient individual and team performers who would deliver excellent professional service exhibiting progress, flexibility, transparency, accountability and in taking up initiatives in their professional work
PEO 3	The graduates will be effective managers of all sorts of real – life and professional circumstances, making ethical decisions, pursuing excellence within the time framework and demonstrating apt leadership skills
PEO 4	They will engage locally and globally evincing social and environmental stewardship demonstrating civic responsibilities and employing right skills at the right moment.

GRADUATE ATTRIBUTES (GA)

Fatima College empowers her women graduates holistically. A Fatimite achieves all-round empowerment by acquiring Social, Professional and Ethical competencies. A graduate would sustain and nurture the following attributes:

I. SOCIAL COMPETENCE	
GA 1	Deep disciplinary expertise with a wide range of academic and digital literacy
GA 2	Hone creativity, passion for innovation and aspire excellence

GA 3	Enthusiasm towards emancipation and empowerment of humanity
GA 4	Potentials of being independent
GA 5	Intellectual competence and inquisitiveness with problem solving abilities befitting the field of research
GA 6	Effectiveness in different forms of communications to be employed in personal and professional environments through varied platforms
GA 7	Communicative competence with civic, professional and cyber dignity and decorum
GA 8	Integrity respecting the diversity and pluralism in societies, cultures and religions
GA 9	All – inclusive skill - sets to interpret, analyse and solve social and environmental issues in diverse environments
GA 10	Self-awareness that would enable them to recognise their uniqueness through continuous self-assessment in order to face and make changes building their strengths and improving on their weaknesses
GA 11	Finesse to co-operate exhibiting team-spirit while working in groups to achieve goals
GA 12	Dexterity in self-management to control their selves in attaining the kind of life that they dream for
GA 13	Resilience to rise up instantly from their intimidating setbacks
GA 14	Virtuosity to use their personal and intellectual autonomy in being life-long learners
GA 15	Digital learning and research attributes
GA 16	Cyber security competence reflecting compassion, care and concern towards the marginalised

GA 17	Rectitude to use digital technology reflecting civic and social responsibilities in local, national and global scenario
II. PROFESSIONAL COMPETENCE	
GA 18	Optimism, flexibility and diligence that would make them professionally competent
GA 19	Prowess to be successful entrepreneursand employees of trans-national societies
GA 20	Excellence in Local and Global Job Markets
GA 21	Effectiveness in Time Management
GA 22	Efficiency in taking up Initiatives
GA 23	Eagerness to deliver excellent service
GA 24	Managerial Skills to Identify, Commend and tap Potentials
III. ETHICAL COMPETENCE	
GA 25	Integrity and discipline in bringing stability leading a systematic life promoting good human behaviour to build better society
GA 26	Honesty in words and deeds
GA 27	Transparency revealing one's own character as well as self-esteem to lead a genuine and authentic life
GA 28	Social and Environmental Stewardship
GA 29	Readiness to make ethical decisions consistently from the galore of conflicting choices paying heed to their conscience
GA 30	Right life skills at the right moment

PROGRAMME OUTCOMES (PO)

The learners will be able to

PO 1	Apply acquired scientific knowledge to solve major and complex issues in the society/industry.
PO 2	Attain research skills to solve complex cultural, societal and environmental issues.
PO 3	Employ latest and updated tools and technologies to solve complex issues.
PO 4	Demonstrate Professional Ethics that foster Community, Nation and Environment Building Initiatives.

PROGRAMME SPECIFIC OUTCOMES (PSO)

On completion of M.Sc. Mathematics programme, the graduates would be able to

PSO 1	Develop proficiency in the analysis of complex mathematical problems and the use of Mathematical or other appropriate techniques to solve them.
PSO 2	Provide a systematic understanding of core mathematical concepts, principles and theories along with their applications.
PSO 3	Demonstrate the ability to conduct Research independently and pursue higher studies towards the Ph. D degree in Mathematics and computing
PSO 4	Understand the fundamental axioms in Mathematics an Mathematical ideas based on them.
PSO 5	Provide advanced knowledge on topics in Pure Mathematics, empowering the students to pursue higher studies.

FATIMA COLLEGE (AUTONOMOUS), MADURAI-18

DEPARTMENT OF MATHEMATICS

For those who joined in June 2019 onwards

MAJOR CORE – 70 CREDITS

PROGRAMME CODE : PSMA

S. No	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDITS	CIA Mks	ESE Mks	TOT. MKs
1.	I	19PG1M1	Algebra	6	4	40	60	100
2.		19PG1M2	Real Analysis	6	4	40	60	100
3.		19PG1M3	Number Theory	6	4	40	60	100
4.		19PG1M4	Classical Mechanics	6	4	40	60	100
5.	II	19PG2M5	Advanced Algebra	6	4	40	60	100
6.		19PG2M6	Advanced Real Analysis	6	4	40	60	100
7.		19PG2M7	Differential Equations	6	4	40	60	100
8.		19PG2M8	Graph Theory	6	4	40	60	100
9.	III	19PG3M9	Measure and Integration	6	4	40	60	100
10.		19PG3M10	Optimization Techniques	6	4	40	60	100
11.		19PG3M11	Combinatorics	6	4	40	60	100
12.		19PG3M12	Topology	6	6	40	60	100
13.	IV	19PG4M13	Complex Analysis	6	5	40	60	100
14.		19PG4M14	Statistics	6	5	40	60	100
15.		19PG4M15	Methods of Applied Mathematics	6	5	40	60	100
16.		19PG4M16	Functional Analysis	6	5	40	60	100

MAJOR ELECTIVE / EXTRA DEPARTMENTAL COURSE / INTERNSHIP/ PROJECT -20 CREDITS

S. No	SEM.	COURSECODE	COURSE TITLE	HRS	CREDITS	CIA Mks	ESE Mks	TOT. Mks
1.	I	19M1EDC	Optimization Methods	3	3	40	60	100
2.	II	19M2EDC	Optimization Methods	3	3	40	60	100
3.	III	21PG3ME1/ 21PG3ME2	Fuzzy sets and Applications/ Numerical Analysis	4	4	40	60	100
4.		19PG3SIL1	Summer Internship	-	3	40	60	100
5.	IV	19PG4ME3/ 19PG4ME4	Formal Languages/ Algebraic Graph Theory	4	4	40	60	100
6.		19PG4L17	Project	-	3	40	60	100
			TOTAL	**14**	**20**			

OFF-CLASS PROGRAMMES

ADD-ON COURSES

COURSE CODE	COURSES	HRS.	CREDITS	SEMESTER IN WHICH THE COURSE IS OFFERED	CIA MKS	ESE MKS	TOTAL MARKS
19PADSS	**SOFT SKILLS**	40	3	I	40	60	100
19PADCA	**COMPUTER APPLICATIONS** LATEX	40	4	II	40	60	100
19PADCV	**COMPREHENSIVE VIVA** (Question bank to be prepared for all the courses by the respective course teachers)	-	2	IV	-	-	100
19PADRC	**READING CULTURE**	10	1	I-IV	-	-	-
	TOTAL		**10**				

EXTRA CREDIT COURSES

COURSE CODE	COURSES	HRS.	CREDITS	SEMESTER IN WHICH THE COURSE IS OFFERED	CIA MKS	ESE MKS	TOTAL MARKS
19PGSLM1	**PROBLEMS IN ADVANCED MATHEMATICS FOR II PG)**	-	2	IV	40	60	100
21PGSLLM1	**Verbal and Numerical Aptitude for National Examinations (For I PG)**	-	2	II	40	60	100
	MOOC COURSES / International Certified online Courses(Department Specific Courses/any other courses) * Students can opt other than the listed course from UGC-SWAYAM /UGC /CEC	-	Minimum 2 Credits	I – IV	-	-	

- **Summer Internship:**
  - Duration-1 month (2nd Week of May to 2nd week of June-before college reopens)
- **Project:**
  - Off class
  - Evaluation components-Report writing + Viva Voce (Internal marks-40) + External marks 60
- **EDC:**
  - Syllabus should be offered for two different batches of students from other than the parent department in Sem-I & Sem-II

I M.Sc. Mathematics
SEMESTER –II
For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSMA	21PGSLLM1	VERBAL AND NUMERICAL APTITUDE FOR NATIONAL EXAMINATIONS	Core	-	2

COURSE DESCRIPTION

This course aims to creating positive attitude among students and motivate them to clear competitive exams to reach their life goals.

COURSE OBJECTIVES

To motivate the students to participate in NET & SET exams, help them for post-examination preparation and to enthuse them to crack NET & SET exams

UNITS

UNIT – I TEACHING AND RESEARCH APTITUDE

Reading Comprehension - Teaching Aptitude - Teaching aids and evaluation system - Research Aptitude, Research Ethics and Thesis writing

UNIT – II VERBAL REASONING

General Abbreviations and terminology - Letter series and codes - Relationships and classification - Verbal Analogy and classification

UNIT – III MATHEMATICAL REASONING AND APTITUDE

Types of reasoning - Number series - Mathematical Aptitude -Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages.

UNIT – IV LOGICAL REASONING

Understanding the Structure of Arguments: argument forms, Structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Classical square of opposition - Evaluating and distinguishing deductive and inductive reasoning – Analogies - Venn Diagram: Simple and multiple uses for establishing validity of arguments.

UNIT – V DATA INTERPRETATION

Sources, acquisition and classification of data - Quantitative and Qualitative data - Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of data - Data and Governance.

REFERENCES

1. Raghu R. Alla& K. Anusha,QuickNET Sure Success SeriesCBSE UGC NET/JRF/SET Teaching & Research Aptitude (General Paper – I), 2019 Edition.
2. K.V.S.MadaanNTA UGC Paper I Teaching and Research Aptitude , Third Edition.

COURSE DESIGNER:

1. Dr.A.Paulin Mary

Forwarded By

(A.Paulin Mary)

HOD's

Signature & Name

II M.Sc. Mathematics

SEMESTER –III & IV

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSMA	19PGSLM1	PROBLEMS IN ADVANCED MATHEMATICS	Core	-	2

COURSE DESCRIPTION

This course enables the students to solve problems in various branches of Mathematics.

COURSE OBJECTIVES

To study the problem solving techniques in Analysis, Algebra and Differential equations.

UNITS

UNIT –I PROBLEMS IN REAL ANALYSIS

Sequences and series, convergence, limsup, liminf. Bolzano Weierstrass theorem, Heine Borel theorem. Continuity, uniform continuity, differentiability, mean value theorem. Sequences and series of functions, uniform convergence. Riemann sums and Riemann integral, Improper Integrals. Monotonic functions, types of discontinuity, functions of bounded variation

UNIT-II: PROBLEMS IN COMPLEX ANALYSIS

Analytic functions, Cauchy-Riemann equations. Contour integral, Cauchy's theorem, Cauchy's integral formula, Liouville's theorem, Maximum modulus principle, Schwarz lemma, Open mapping theorem. Taylor series, Laurent series, calculus of residues.

UNIT-III: PROBLEMS IN ALGEBRA

Groups, subgroups, normal subgroups, quotient groups, homomorphisms, cyclic groups, permutation groups, Cayley's theorem, class equations, Sylow theorems. Rings, ideals, prime and maximal ideals, quotient rings, unique factorization domain, principal ideal domain, Euclidean domain. Fields, Field extensions.

UNIT-IV: PROBLEMS IN LINEAR ALGEBRA

Vector spaces, subspaces, linear dependence, basis, dimension, algebra of linear transformations. Algebra of matrices, rank and determinant of matrices, linear equations. Eigenvalues and eigenvectors, Cayley-Hamilton theorem. Matrix representation of linear transformations. Inner Product spaces

UNIT-V: PROBLEMS IN DIFFERENTIAL EQUATIONS

Existence and uniqueness of solutions of initial value problems for first order ordinary differential equations, singular solutions of first order ODEs, system of first order ODEs. Lagrange and Charpit methods for solving first order PDEs, Cauchy problem for first order PDEs. Classification of second order PDEs

REFERENCE BOOKS:

1. Walter Rudin, Principles of Mathematical Analysis, Third Edition, McGraw-Hill International Book Company, New York, 1976

2. John B. Conway, Functions of one Complex Variable, Second Edition, Springer Graduate Texts in Mathematics, New York, 1978

3. Joseph .A. Gallian , Contemporary Abstract Algebra , 7Th Edition Katherine Tegen Books

4. Seymour Lipschutz and Marc Lipson, Schaum's Outlines Linear Algebra Third Edition

5. Gilbert Strang , Introduction to Linear Algebra Fourth Edition, Wellesley Cambridge Press

6. Earl A. Coddington, An Introduction to Ordinary Differential Equations, Prentice-Hall of India, New Delhi, 1992

7. M.D. Raisinghania, Advanced Differential Equations, S. Chand and Company Ltd, New Delhi, 2001

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

- **PG CIA Components**

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	2 *	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Seminar	1	-	5 Mks
C6	-	Attendance		-	5 Mks

The best out of two will be taken into account

COURSE OUTCOMES

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Solve problems in Real Analysis	K2	PSO1& PSO2
CO 2	Solve problems in Complex Analysis	K2	PSO3
CO 3	Solve problems in Algebra	K2 & K3	PSO5
CO 4	Solve problems in Linear Algebra	K3 & K5	PSO2
CO 5	Solve problems in Differential Equations	K3 & K4	PSO4

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2
CO2	2	2	3	2	2
CO3	2	2	2	2	3
CO4	2	3	2	2	2
CO5	2	2	2	3	2

Mapping of COs with POs

CO/ PO	PO1	PO2	PO3	PO4
CO1	2	3	2	2
CO2	2	3	2	2
CO3	2	3	2	2
CO4	2	3	2	2
CO5	2	3	2	2

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER:

Department staff members

Forwarded By

(A.Paulin Mary)

HOD's

Signature & Name