DEPARTMENT OF MATHEMATICS

Teaching Schedule

Course Objectives: To rephrase basic concept of complex numbers, Functions, Integers, Matrix algebra and vector Space for constructing base to illustrate complex analysis, Linear algebra.

Course outcomes: Upon completion of the course, students shall be able to

CO1: outline of fundamental terms and concepts of matrices, vectors and complex numbers.

CO2: compresence the use of various form of complex numbers to solve numerical problems.

CO3: classify various types of functions.

CO4: apply the matrix calculus in solving of linear algebraic equations**.**

CO5: understand basic concepts of vectors in R^n.

Unit	Sub Unit	No. of Lect.(s)	Topics	Reference Chapter/ Additional Reading	Teaching Methodology to be used	Active Learning Activities	Evaluation parameter
Unit 1: Complex numbers: [17 hours]							
1	1.1	5	Polar representation of complex numbers	Ch#2 Complex numbers from A to…Z	Chalk & Talk / Presentation	**For Slow Learner:** Students must solve some examples given by teacher after completion of unit.	Assignment 1 Unit Test 1 Internal Exam
	1.2	2	nth roots of unity				
	1.3	7	De Moivre's theorem for rational indices and its applications.				

DEPARTMENT OF MATHEMATICS

				Titu Andreescu and Dorin Andrica		**For Advanced Learner:** Students will able to solve some application based examples given by teacher after completion of unit.	
Unit 2: Functions and integers: [23 hours]							
2	2.1	2	Equivalence relations	Ch#2 , 3,4,5 Discrete Mathematics with graph theory goodaire	Chalk & Talk / Presentation	**For Slow Learner:** Students must solve some examples given by teacher after completion of unit. **For Advanced Learner:** Students will able to solve some application based examples given by teacher after completion of unit.	Assignment 2 Unit Test 1, 2 Internal Exam
	2.2	2	Functions				
	2.3	1	Composition of functions				
	2.4	1	Invertible functions				
	2.5	2	One to one correspondence and cardinality of a set				
	2.6	2	Well-ordering property of positive integers				
	2.7	1	Division algorithm				
	2.8	2	Divisibility and Euclidean algorithm				
	2.9	2	Congruence relation between integers				
	2.10	3	Principles of mathematical induction				
	2.11	2	Principles of mathematical induction				
Unit 3: Matrix algebra: [21 hours]							
3	3.1	2	Definitions and types of matrices	Ch# 1 Elementary Linear	Chalk & Talk / Presentation	**For Slow Learner:** Students must solve	
	3.2	1	Operations on matrices				

DEPARTMENT OF MATHEMATICS

Semester: I	Integrated M.Sc. Mathematics	Academic Year: 2019-20
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	3.3	2	Inverse of a matrix	Algebra-Applications version Howard Anton and Charis Rorres		some examples given by teacher after completion of unit. **For Advanced Learner:** Students will able to solve some application based examples given by teacher after completion of unit.	Assignment 3 Unit Test 2 Internal Exam
	3.4	3	Row reduction and echelon forms				
	3.5	2	Rank and nullity of Matrix				
	3.6	2	Introduction to system of linear equations				
	3.7	3	Homogenous and non-Homogenous system of linear equations				
	3.8	3	Methods to solve system of linear equations				
Unit 4: Basic concepts of vectors and vector space: [14 hours]							
4	4.1	1	Introduction to vectors	Ch#3 Elementary Linear Algebra-Applications version Howard Anton and Charis Rorres	Chalk & Talk / Presentation	**For Slow Learner:** Students must solve some examples given by teacher after completion of unit. **For Advanced Learner:** Students will able to solve some application based examples given by teacher after completion of unit.	Assignment 4 Unit Test 2 Internal Exam
	4.2	1	Norm of a vector				
	4.3	2	Vector arithmetic				
	4.4	2	Dot product				
	4.5	2	Projection				
	4.6	2	Cross Product,				
	4.7	2	Lines and Planes in 3 –Space				

DEPARTMENT OF MATHEMATICS

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Text book:

1. Howard Anton, Chris Rorres – "Elementary Linear Algebra" Application Version, Wiley India Edition.

Reference books:

1. J K Sharma -"Discrete Mathematics"- 3rd Edition, Macmillan India Limited, 2011.
2. Rosen K.H. – "Discrete Mathematics and its Applications" ,6th Edition ,Tata McGraw Hill, 2006.
3. David C. Lay - "Linear Algebra and its Applications"- 3rdEdition, Pearson Education Asia, Indian Reprint, 2007.

Course Units and Course Outcomes Mapping:

Unit No.	Unit	Course Outcomes				
		CO1	CO2	CO3	CO4	CO5
1	Complex numbers	✓	✓			
2	Functions and integers			✓		
3	Matrix algebra	✓			✓	
4	Basic concepts of vectors and vector space	✓				✓

Programme Outcomes (PO)

PO1: Knowledge

Provides knowledge about the fundamentals of pure, applied and computing mathematics and its applications to students that creates the opportunities in industries and research centers.

PO2: Core Competence

Creates competency in science and mathematics to formulate, analyses and solve problem and/or also to pursue advanced study or research.

PO3: Breadth

Trains students having good knowledge in unearth core of academia and industry by the roots of mathematics.

PO4: Evaluation

Imparts in students to raise trial and error-based curiosity and problem-solving functionality with research based advanced tutorial for higher level decision makings tools.

Programme Outcomes and Course Outcomes mapping:

Programme Outcomes	Course outcomes				
	CO1	**CO2**	**CO3**	**CO4**	**CO5**
PO1	✓			✓	
PO2		✓	✓		
PO3			✓		✓
PO4				✓	✓