



UNIVERSITY OF KASHMIR, SRINAGAR
NAAC Accredited Grade-A+

Notification

It is notified for information of all the concerned that the Vice-Chancellor in anticipation of approval of the Academic Council has authorized prescription of Bridge Course syllabus (for students with Non- Mathematical background) for 2-year MCA Programme under the Choice Based Credit System applicable to batch -2024 & onwards.

No.F (Pres-syllabus-Bridge course MCA/ Acad/ 25
Date: - 21-01-2025

**Joint Registrar
(ACADEMIC)**

21.01.2025
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Copy for information to the:-

1. Dean, Academic Affairs, University of Kashmir, Srinagar;
2. Dean School Applied Science and Technology University of Kashmir Srinagar.
3. Head, Department of Computer Sciences, University of Kashmir, Srinagar.
4. Controller of Examinations, University of Kashmir, Srinagar.
5. Assistant Controller, Secrecy/Tabulation/Automation, University of Kashmir, Srinagar;
6. File.

COURSE TITLE: Foundational Mathematics										
Course Code: MCA24001BC						Examination Scheme	T	P		
Total number of Lecture Hours: 28						External	40	-		
Total number of Practical Hours: -						Internal	10	-		
Lecture (L):		2	Practical (P):		-	Tutorial (T):		-	Total Credits	0
Course Objectives										
<ul style="list-style-type: none">• Capable of inquiring and understanding a wide range of concepts in mathematics.• Able to understand the algebraic concepts of mathematics in sets, relations, functions, groups and Matrices.• Able to understand the concepts of analytical geometry and vectors.• To understand the basic notions of symbolic logic.										
Course Content								TEACHING HOURS		
UNIT 1:								14Hrs		
<p>Set Theory: Definition and representation of sets, types of sets (universal, empty, singleton, finite, infinite, equal, subsets, power sets), operations on sets (union, intersection, complement), De Morgan's laws, disjoint sets, Venn diagrams, and their applications.</p> <p>Relations and Functions: Properties of relations, equivalence relations, types of functions, composite and inverse functions.</p> <p>Number Theory Overview: Natural, whole, integers, rational, irrational, real, and complex numbers, binary operations on sets, prime and composite numbers, GCD, LCM, and basic number theory problems.</p>										
UNIT 2:								14Hrs		
<p>Mathematical Logic: Propositions, truth values, logical connectives, converse, inverse, contrapositive, tautology, contradiction, logical equivalence, normal forms (disjunctive, conjunctive).</p> <p>Groups and Vectors: Definition of groups, properties, subgroups, vector operations (addition, dot and cross products), vector projection, and geometric applications (area of parallelogram and triangle, scalar triple product, volume of parallelepiped).</p> <p>Analytical Geometry and Linear Programming: Basic concepts of analytical geometry in two dimensions, coordinates, distance and section formulas, introduction to Linear Programming Problems (LPP), formulation and graphical solution of LPP.</p>										
Textbooks:										
<ol style="list-style-type: none">1. R.S. Aggarwal, "Senior Secondary School Mathematics", Bharti Bhawan; Latest Edition (2021 or later).2. Kenneth H. Rosen, "Discrete Mathematics and Its Applications", McGraw-Hill Education; 8th Edition (2019).3. Susanna S. Epp, "Discrete Mathematics with Applications", Cengage Learning; 5th Edition (2022)										
Reference Books:										
<ol style="list-style-type: none">1. R.K. Jain and R.K. Sharma, "Discrete Mathematics", Laxmi Publications; Latest Edition (2020).2. Kenneth H. Rosen, "Discrete Mathematics and Its Applications", McGraw-Hill Education; 8th Edition (2019).3. Clifford Stein, Robert L. Drysdale, and Kenneth H. Rosen, "Discrete Mathematics: An Introduction to Mathematics for Computer Science", Pearson; 8th Edition (2018).4. Roger A. Horn, "Discrete Mathematics: An Applied Introduction", Wiley; 2nd Edition (2017).										

To be effective from year-2024

COURSE OUTCOMES (CO):

CO1: The program outcome is to give foundation knowledge for the students to understand basics of mathematics including applied aspect for developing enhanced quantitative skills and pursuing higher study and research as well.

CO2: By the time students complete the course, they will have wide ranging application of the subject and have the knowledge of set theory.

CO3: The main objective of the course is to equip the student with necessary analytic and technical skills. By applying the principles of basic mathematics, he/ she learns to solve a variety of practical problems in science, social science, engineering, Commerce and Management etc.

CO4: The student is equipped with standard concepts and tools at an intermediate to advance level that will serve him/her well towards taking more advance level course in mathematics.

LEVEL OF CO-PO MAPPING TABLE

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	3	2	2	2	-	-	-	2	2	2	3
2	3	3	2	2	2	-	-	-	2	2	2	3
3	3	3	2	2	2	-	-	-	2	2	2	3
4	3	3	2	2	2	-	-	-	2	2	2	3



To be effective from year-2024

COURSE TITLE: Problem Solving Techniques							
Course Code: MCA24002BC				Examination Scheme	T	P	
Total number of Lecture Hours: 28				External	40	-	
Total number of Practical Hours: -				Internal	10	-	
Lecture(L):	2	Practical (P):	0	Tutorial(T):	0	Total Credits	0
Course Objectives							
<ul style="list-style-type: none">To introduce fundamental concepts of problem-solving methodologies.To familiarize students with computational tools and techniques to solve complex problems.To apply problem-solving strategies to real-world scenarios and case studies.							
Course Content						TEACHING HOURS	
UNIT 1: Problem Solving Algorithms and Computational Methods						-14 Hrs	
Definition and importance of problem solving. Problem-solving methodologies and approaches. Problem Identification and Analysis. Problem decomposition and abstraction. Problem classification. Analytical techniques for problem analysis. Introduction to algorithms. Computational methods for problem solving: searching, sorting, optimization algorithms. Implementing algorithms in a programming language (e.g., Python).							
UNIT 2: Tools and Techniques for Problem Solving						-14 Hrs	
Decision-making processes in problem solving. Evaluating potential solutions. Criteria for assessing solution effectiveness. Tools and software for problem solving (e.g., MATLAB, R). Hands-on exercises using computational tools to solve complex problems. Applying problem-solving strategies to real-world case studies. Real-world applications of problem-solving techniques.							
Textbooks							
<ol style="list-style-type: none">"Problem Solving Techniques" by Steven G. Krantz, Latest Edition, 2015"Problem-Solving Strategies" by Arthur Engel, 1st Edition, 2011."Introduction to Algorithms" by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein, 4th Edition, 2022.							
Reference Books							
<ol style="list-style-type: none">"Structured Problem Solving: Methods, Skills, and Tools for Collaborative Problem Solving" by Hajo Eickenberg and Peter L. Bock, 1st Edition, 2021."The Art of Problem Solving: Volume 1, The Basics" by Sandor Lehoczky and Richard Rusczyk, Latest Edition, 2021							

To be effective from year-2024

COURSE OUTCOMES(CO):

CO1: Identify and classify various types of problems.

CO2: Analyse problems by breaking them down into manageable components.

CO3: Formulate effective strategies and approaches to solve problems.

CO4: Apply algorithms and computational methods to find solutions

LEVEL OF CO-PO MAPPING TABLE

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	3	2	2	1	1	-	-	1	1	-	1
2	3	3	2	3	2	1	-	-	1	2	-	1
3	3	3	3	3	2	2	-	-	2	2	-	1
4	3	3	3	2	3	2	-	-	2	2	-	1






