

(Mandatory Learning Course) A bridge course for graduates joined for MCA Programme without study of Mathematics at 10+2 level or at Graduation level			
Course Title:	Addiotional Mathematics		
Course Code:	1MMC110	CIE Marks	100
Teaching Hours/Week (L:T:P:S)	3:0:0:0	Total Marks	100
Total Hours of Pedagogy	40	Credit	PP
Course objectives: Course objectives: The mandatory learning course 22MCA20 viz., Mathematics Bridge Course for MCA aims to provide basic concepts of Sets, Relations, Logic, Matrices & Determinants, Sequences & Series and Probability Theory.			
Teaching-Learning Process (General Instructions) These are sample Strategies; which teachers can use to accelerate the attainment of the various course outcomes. ➤ The lecture method (L) need not be only the traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes. ➤ Use of Video/Animation to explain the functioning of various concepts. ➤ Encourage collaborative (Group Learning) Learning in the class. ➤ Ask at least three HOT (Higher-order Thinking) questions in the class, which promotes critical thinking. ➤ Adopt Problem-Based Learning (PBL), which fosters students' Analytical skills, and develops design thinking skills such as the ability to design, evaluate, generalize, and analyse information rather than simply recall it. ➤ Show the different ways to solve the same problem and encourage the students to come up with creative ways to solve them. ➤ Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.			
Module-1: Set Theory (8 hours)			
Introduction. Representation of sets, Types of Sets, Finite set, Infinite set, equivalent set, disjoint set, Subset, Power set. Venn diagram. Set operations: Union, Intersection, Complement of a set, Difference, Symmetric Difference. Laws of set theory. Cartesian product of sets, Relations and properties.			
Module-2: Logic and Propositions (8 hours)			
Logic Statement, Propositions, Connectives, Basic Logic Operations: Conjunction, Disjunction, Negation, Implication and Double Implication. Truth table, Logical Equivalence/Equivalent Statements, Tautologies and Contradictions.			
Module-3: Matrices and Determinants (8 hours)			
Matrix Introduction, Types of matrices, Scalar multiplication, Addition of matrices, Product of matrices. Transpose of a matrix, Symmetric and Skew Symmetric matrix, Rank of a matrix, Determinant of a matrix. Singular matrix.			
Module-4: Sequence and Series (8 hours)			

Introduction, Sequences, Series, Arithmetic Progression, Sum of Finite number of terms in A.P, Arithmetic Means, Geometric Progression, sum to n terms of G.P, Geometric Mean, relation between A.M and G.M.

Module-5: Probability Theory (8 hours)

Probability: Introduction, random experiments, sample space, events and algebra of events. Definitions of Probability – classical, and axiomatic. Conditional Probability, laws of addition and multiplication, independent events, theorem of total probability, Bayes' theorem and its applications.

Assessment Details (CIE)

The weightage of Continuous Internal Evaluation (CIE) is 100%. The minimum passing mark for the CIE is 50% of the maximum mark (100). A student shall be deemed to have satisfied the academic requirements if the student secures not less than 50% (50 Marks out of 100) in the CIE.

Continuous Internal Evaluation:

Three Unit Tests each of 30 Marks (duration 01 hour)

1. The first test at the end of 5th week of the semester
2. The second test at the end of the 13th week of the semester

Two assignments each of 20 Marks:

4. First assignment at the end of the 4th week of the semester
5. Second assignment at the end of the 9th week of the semester

Course Seminar suitably planned to attain the COs and POs for 20 Marks (duration 01 hours).

The sum of two tests, two assignments, and a seminar will be out of 100 marks The student shall secure a minimum of 50% of marks of the course to qualify and become eligible for the award of a degree.

Course outcome (Course Skill Set)

At the end of the course, the student will be able to:

C01	Widen the knowledge of Basic concepts in Set Theory and Apply the fundamentals of set theory and Relations to the given problem
C02	Understand mathematical reasoning to read, comprehend and construct mathematical arguments
C03	Understand the Basic Concepts in Matrices and Formulate the problems in Matrix expression
C04	Determine the sum of the first n terms of an arithmetic and Geometric series
C05	Get the basic concepts of probability and find the probability of simple and compound events

Suggested Learning Resources: Books

1. Kenneth H Rosen, "Discrete Mathematics and its Applications", McGraw Hill publications, 7th edition.
2. Walpole Myers Ye "Probability and Statistics for engineers and Scientist" Pearson Education, 8th edition.
3. Richard A Johnson and C. B Gupta "Probability and statistics for engineers" Pearson Education.

4. J.K Sharma “Discrete Mathematics”, Mac Millan Publishers India, 3rd edition,2011.
5. Higher Engineering Mathematics, B. S. Grewal, Khanna Publishers, 43rd Edition, 2015.

Web links and Video Lectures (e-Resources):

- <http://.ac.in/courses.php?disciplineID=111>
- [http://www.class-central.com/subject/math\(MOOCs\)](http://www.class-central.com/subject/math(MOOCs))
- <http://academicearth.org/>
- VTU EDUSAT PROGRAMME-20

Activity-Based Learning (Suggested Activities in Class)/ Practical Based learning

- Quiz
- Group assignment
- Seminars