Semester	**2**
Course [*1]	**Multi-disciplinary**
Paper Code	M1MT230211T
Paper Title	**Symmetries and Patterns**
No. of Credits [*2]	**3**
Theory / Practical / Composite	**Theory**
Minimum No. of preparatory hours per week a student has to devote	**3**
Number of Modules	**Nil**
Syllabus	• Nim Games (2), Magic square (2) Logic through puzzles (4) Kongsa Bridge Problem (2) Handshake problem (1) Graphs colouring problems, Hamiltonian, Eulerian through examples (5) Pigeon Hole principle(2) • Movement control and mathematical vectors (2) • Royal Hammer (2) Brujin Sequences, Universal Cycles (4) Gilbreath Principle (2)Mandelbrot Set(2) Perfect shuffles, Monge Milk shuffles, Inside down under shuffles, Miracle Divination (5) Books of changes, Probability in book of changes, I ching and probability(4)
Learning Outcomes [*3]	• Getting familiarized with the strange, semi-secret world of modern conjuring which are solely based on mathematical principles. • Identifying symmetries, patterns and mathematical properties of unusual shuffles thereby getting introduced to Mathematical Magic. Getting introduced to many little-known theorems of advanced Mathematics and leading a path from delightful self-working magic tricks to serious math and then again back to magic.
Reading/Reference Lists [*4]	• Jason Davison and Peter McQwan: Maths Made Magic

	Diaconis and Graham: Magical Mathematics	
Evaluation	Theory CIA: 10+3+2=15 Semester Exam: 35	Practical (if applicable) CA: Semester Exam:
Paper Structure for Theory Semester Exam	7 questions each carrying 5 marks out of 11 questions	