MOHANLAL SUKHADIA UNIVERSITY, UDAIPUR
M. A. / M. Sc. MATHEMATICS (FINAL)
2016-17
Non-Collegiate

Note- There will be five papers in all. Paper-I: Topology and Functional Analysis and Paper-II: Discrete Mathematics will be compulsory. Each paper will be assigned six hours per week.

Paper I	Topology and Functional Analysis	100	3 Hrs.	6
Paper II	Discrete Mathematics	100	3 Hrs.	6

Optional Papers

Any three of the following paper with the permission of the Head of the Department of Mathematics & Statistics.

Paper III	Relativity and Cosmology	100	3 Hrs.	6
Paper IV	Viscous Fluid Dynamics	100	3 Hrs.	6
Paper V	Number theory	100	3 Hrs.	6
Paper VI	Numerical Analysis	100	3 Hrs.	6
Paper VII	Integral Equations and Internal Transforms	100	3 Hrs.	6
Paper VIII	Optimization Techniques	100	3 Hrs.	6
Paper IX	Advanced Topology	100	3 Hrs.	6
Paper X	Computer Programming	Th. 75 Per. 25	3 Hrs. 2 Hrs.	Th. 04 Pre. 02
Paper XI	Mathematical Theory of Statistics	100	3 Hrs.	6
Paper XII	Space Dynamics	100	3 Hrs.	6
Paper XIII	Astronomy	100	3 Hrs.	6
Paper XIV	Compressible Fluids and Magneto hydro Dynamics	100	3 Hrs.	6

Note:

* **Scheme of Examination:**

Question Paper Pattern for Examination: 100 marks

Section A: Total 10 Question will be set from five units i.e. two question from each unit. These questions require very short answer. Each question will be of one (1) mark (Total 10 marks). All the questions in section A are compulsory.

Section B: Total 10 questions will be set from five units i.e. two question from each unit. Students are required to attempt at least one question from each unit. Each question carries 10 marks (Total 50 marks). The answer of each question should be given approximately in 250 words.

Section C: Total 4 descriptive question will be set from five units of the paper, not more than one question from each unit. Each question may also have two sub-division. Students are required to answer two questions in about 500 words. Each question carries 20 marks (Total 40 marks).

** The right to information act, 2005 is applicable.

PAPER-X
COMPUTER PROGRAMMING
TIME: 3 hours **Max. Marks: 100**

UNIT-I

Information and Data concepts: Definition of information, and data categories, Features and levels of information, Number system in computers, classification of computers, elementary idea about components, devices in a computer system, specification of a modern computer system.

Concept of Software, System and application of software, computer interpreters and assembler, Operating system, overview of DOG commands Overview of GUI and concept of windows, computer network and its uses, concepts of Internet, www, htp, Telnet, e-mail.

UNIT-II

Programming languages, classification of programming languages, Generation of languages, steps in programme development, Problem identification, algorithms, flow charting, Program coding, testing & debugging. Fundamentals of C Programming: Overview of G, data types, contents and variables, operations and expressions, control constituents; If then-for and while. Type modifiers, Type casting.

UNIT-III

Arrays, functions, Basic I/O, Do-while, switch, Break and continue, exit( ) functions, Program design examples: Summation of set of numbers, generation of positive prime numbers, Generation of fibonacci sequences, finding kith smallest element, sorting by insertion of alphabets & numeric information.

Scope rules, functions: Parameters, Passing, call by value and reference functions with arrays, Recursion, Pointers, in G. file handling in C, C standard and header files.

UNIT-IV

Computer Arithmetic: Floating point representation of numbers, arithmetic operations with normalized floating point numbers, consequences of normalized floating point representation, computing pitfalls, errors in numbers, Binary representation of numbers.

Iterative Methods: The method of successive bisection, false position, Newton-Rapson iterative method, secant method, successive approximation, comparison of iterative methods, solution of polynomial equations, solution of simultaneous non linear equations.

UNIT-V

Solution of simultaneous algebraic equations: Gauss elimination method, Pivoting, Ill-conditioned equations, Gauss-Seidel iterative method and Algorithm, comparison of direct

and iterative methods. Differentiation & Integration: formulae for numerical differentiation, Numerical integration Simpson's rule, errors in integration formulae algorithms for integration of tabulated function, algorithms for integrating knowm function, Gaussian quadrature formulae.

Numerical Solutions of differential equations: Eulers method. Taylor's series method, Runge Kutta method, Runge Kutta fourth order formulae, Higher order differential equations, Predictor-corrector method and its comparison with Runge Kutta methods.

Books Recommended:

1. Introduction Information Technology-Satish jain, BPB Publication, Cannought Place, New Delhi.
2. Fundamentals of computers-V.Rajaraman PHI Ltd.
3. The c-Programming Language B.W.Kernyharn & D.M. Ritche- PHI Ltd.
4. Computer Programming inc.-Kanetekar-B.P.B. Publication, New Delhi.
5. Computer oriented Numerical Methods-V. Rajraman PHI Ltd.

Note:

1. Candidates who have offered Computer Programming/ Computer Science/ Computer Applications in B.A. /B.Sc. /M.C.A courses will not be allowed to offer this subject/paper in their M.A./ M.Sc. examination.
2. Only ten students will be allowed to offer this course on the basis of merit of M.A./M.Sc. Previous Mathematics examination.
3. Four hours will be given to theory and two hours will be given for practical per week. Practical will be based on theory paper.
4. Questions from Unit IV and V will be based on programming.
5. Ten marks will be allotted for file work and oral examination.
6. This course will run only after the necessary infrastructure facilities have been provided to the department.