MAHARISHI MAHESH YOGI VEDIC VISHWAVIDYALAYA
DIRECTORATE OF DISTANCE EDUCATION
SCHEME FOR M.A. (Mathematics) / M.Sc. (Mathematics)

FIRST YEAR

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<tr>
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<td>2DMMATH1</td>
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FUNDAMENTALS OF MAHARISHI VEDIC SCIENCE

(MAHARISHI VEDIC SCIENCE – I)

PG COURSES

UNIT – I
Meaning of Guru Pujan
Name of 1-20 areas of Vedic Science & their expression in Human Physiology, detail with diagram
Consciousness – Characteristics and types

UNIT – II
Maharishi’s Yoga – Principles of Yoga Asans, A general Introduction of T.M., T.M. & T.M. Sidhi Program
Types of Speech

UNIT – III
Third law of Thermodynamics, Miessiner Effect, Maharishi Effect

UNIT – IV
Introduction to Maharishi’s Vedic Swasthya Vidhan, Theories of Dincharya & Ritucharya, Theories of Ayurved.

UNIT – V
Theory of Invincibility. Introduction to Maharishi Jyotish.

Suggested Readings:
- Maharishi Sandesh -1and 2, II-His Holiness Maharishi Mahesh Yogijee
- Scientific Yoga Ashanas –Dr.Satpal.
- Chetna Vigyan His Holiness Maharishi Yogi Ji.
- Dhyan Shailly by Brahmchari Dr. Girish Ji
ADVANCED ABSTRACT ALGEBRA

UNIT - I


UNIT - II


Cyclic modules simple modules Semi-simple modules. Schuler’s Lemma Free modules.

UNIT - III


UNIT - IV


Smith normal form over a principal ideal domain and rank.

UNIT - V

Fundamental Structure theorem for finitely generated modules over a principal ideal domain and its applications to finitely generated abelian groups. Rational canonical form. Generalised Jordan form over any field.
REAL ANALYSIS

UNIT - I
Definition and existence of Riemann- Stielties integral, properties of the Integral, Integration and differentiation, the fundamental theorem of Calculus, integration of vector-valued functions, Rectifiable curves.

UNIT - II
Sequences and series of functions, point and uniform convergence, Cauchy criterion for uniform convergence, Weierstrass M-test, Abel’s and Dirichlet’s tests for uniform convergence and continuity, uniform convergence and Riemann-stielties integration, uniform convergence and differentiation, Weierstrass approximation theorem, power series, uniqueness theorem for power series, Abel’s and Tauber’s theorems.

UNIT - III
Functions of several Variables, linear transformations, Derivatives in an open subset of $\mathbb{R}^n$, Chain rule, Partial derivatives, interchange of the order of differentiation, Derivatives of higher orders, Taylor’s theorem, Inverse function theorem, Implicit function theorem, jacobians, extremum problems with constraints, lagrange’s multiplier method, Differentiation of Integrals, Partitions of unity, Differential forms, Stoke’s theorem.

UNIT - IV


UNIT - V
Measures and outer measures, Extension of a measure. Uniqueness of Extension. Completion of a measure. Integration with respect to a measure.

TOPOLOGY

UNIT - I


UNIT - II
Alternate methods of defining a topology in terms of Kuratowski Closure Operator and Neighbourhood systems.

Continuous function and homeomorphism.


UNIT - III
Separation axioms $T_0$, $T_1$, $T_2$, $T_3$, $T_4$, their characterizations and basic properties. Urysoin’s lemma. Tietze extension theorem.


UNIT - IV


Embedding and metrization. Embedding lemma and Tychonoff embedding. The Urysohn metrization theorem.

UNIT - V

Metrization theorems and paracompactness-local finiteness. The nagata-smirnov metrization theorem. Paracompactness. The smirnov metrization theorem.

The fundamental group and covering spaces – Homotopy of paths. The fundamental group. Covering spaces. The fundamental group of the circle and the fundamental theorem of algebra.
UNIT - I
Homegenous Linear Equation with Variable coefficient Simultaneous differential equation, Total differential Equation.

UNIT - II

UNIT - III
Dependence on initial conditions and parameters; Preliminaries. Continuity Differentiability, Higher Order Differentiability.


UNIT - IV

UNIT - V
Partial differential Equation of first & Second order. Linear partial differential Equation with constant coefficient.
ADVANCED DISCRETE MATHEMATICS

UNIT - I

**Formal Logic** – Statements, Symbolic Representation and Tautologies. Quantifiers, Predicates and Validity, Propositional Logic.


UNIT - II

**Lattices** – Lattices partially ordered. Their properties. Lattices as Algebraic system. Sublattices, Direct products, and Homomorphisms. Some Special Lattices e.g., Complete, Complemented and Distributive Lattices.


UNIT - III


UNIT - IV


Turing Machine and Partial Recursive Functions.

UNIT - V


Notions of Syntax Analysis, Polish Notations, Conversion of Infix Expressions to Polish Notations. The Reverse Polish Notation.
DIFFERENTIAL GEOMETRY OF MANIFOLDS

UNIT - I

UNIT - II

UNIT - III

UNIT - IV

UNIT - V
SECOND YEAR

ADVANCED CONCEPTS OF MAHARISHI VEDIC SCIENCE
(MAHARISHI VEDIC SCIENCE –II)

PG COURSES

UNIT – I
Name of 21-40 areas of Vedic Science & their expression in Human Physiology and detail with diagram. Consciousness, types of consciousness, characteristics of higher stages of consciousness.

UNIT – II
Introduction to Maharishi Gandharva Veda
Introduction to Maharishi Sthapatya Ved

UNIT – III
Introduction to Maharishi Vedic Management
Fundamental Elements of Vedic Management: Totality
Ideal Management in Indian Society (Ashram Vavstha :Cast, Religious)
Management Science and Art.

UNIT – IV
Maharishi Absolute theory of Defence.
Maharishi Absolute theory of Development.
Maharishi Absolute theory of Information.

UNIT – V
Maharishi’s Swasthya Vidhan.
Scientific Research based on T.M. & T.M. Sidhi Programme.

Suggested Readings:
Maharishi Sandesh -1and 2 , II-His Holiness Maharishi Mahesh YogiJee
Scientific Yoga Ashanas –Dr.Satpal.
Chetna Vigyan His Holiness Maharishi YogiJee.
Dhyan Shailly by Brahmchari Dr. Girish Ji
INTEGRATION THEORY AND FUNCTIONAL ANALYSIS

UNIT - I

Integration Theory: Sinned measure, Hahn decomposition theorem, mutually singular measures, Radon-Nikodym theorem, Labesgue decomposition, Riesz representation theorem, Extension theorem (Caratheodory), Lebesgue-Stieltijes integral, product measures, Fubini’s theorem.

UNIT - II

Baire sets, Baire measure, continuous functions with compact support, Regularity of measures on locally compact spaces, Integration of continuous function with compact support, Riez-Markoff theorem.

UNIT - III

Functional Analysis: Normed Linear Spaces, Banach Spaces with examples, Quotient space of normed linear space and its completeness, bounded linear transformations, normed linear space of bounded linear transformations, dual (conjugate) spaces with examples, natural imbedding of a normed linear space in its second dual, open mapping theorem, closed graph theorem, uniform boundedness principle and its consequences.

UNIT - IV

Finite dimensional normed spaces and subspaces, Equivalent norms, finite dimensional normed linear spaces and compactness, Riesz lemma, Hahn Banach theorem for real linear space, complex linear space, and normed linear space, Adjoint operators, Reflexive spaces, Weak convergence, weak” Convergence.

UNIT - V

Inner product space, Hilbert space, Orthogonal Complements, Orthonormal sets, Bessel’s inequality, complete orthonormal sets and passeval’s identity, conjugate space H” and reflexivity of Hilbert space, Adjoint of an operator on a Hilbert space, self-adjoint operators, positive, projection, normal and unitary operators.
PARTIAL DIFFERENTIAL EQUATIONS & MECHANICS

UNIT - I

UNIT – II

UNIT - III

UNIT - IV

UNIT - V
INTTEGRAL EQUATIONS AND BOUNDARY VALUE PROBLEMS

UNIT - I


UNIT - II

Integral Transform Method, Fourier Transform. Laplace Transform, Convolution integral. Application to volterra integral equations with convolution – type kernels. Abel’s equations. Inversion formula for singular integral equation with kernel of the type \((h(s)-h(t))a, 0<a<1\). Cauchy’s Principal value of singular integrals. Solution on the Cauchy-type singular integral equation. The Hilbert kernel. Solution on the Hilbert-type singular integral equation.

UNIT - III


UNIT - IV


UNIT - V

Integral representation formulas for the solution of the Laplace’s and Poission’s equations. Newtonian single-layer and double layer potentials. Interior and exterior Dirichief and Neumann boundary value problems for Laplace’s equation Green’s function for Laplaces’s equation in a free space as well as in space boundary by a ground vessel. Integral equation formulation of boundary value problems for Laplace’s equation.
THEORY OF APPROXIMATION AND LINEAR OPERATION

UNIT - I

UNIT - II

UNIT - III

UNIT - IV

UNIT - V
OPERATIONS RESEARCH

UNIT - I


UNIT - II

UNIT - III

UNIT - IV
Integer Programming-Branch and Bound Technique, Simulation Replacement Problems, sequencing.

UNIT - V
INTEGRAL TRANSFORMS WITH APPLICATIONS

UNIT - I
The laplace transforms & its inversions: Definition. Laplace transform of elementary Sectionally continuous and exponential order function including its existence, some important properties of laplace transforms of derivatives and integrals. Multiplication and division by I periodic functions. Initial and final value theorems, laplace transforms of some special functions. Definition and uniqueness theorem of inverse laplace transform. Inversion of some elementary functions, some properties of inverse laplace transform. Inverse laplace transform of derivatives and integrals. Multiplication and division by power of ‘s’. The convolution property. Complex inversion formula, Heaviside expansion formula, Evaluation of integrals.

UNIT - II

UNIT - III
Fourier Series and Integrals: Fourier series, Odd and Even functions, Half range fourier sine and cosine series complex form of fourier series, Parseval’s Identity for fourier series finite fourier transforms, the fourier integral/ at including its complex form, fourier transforms, including sine and cosine transforms convolution theorem, Parseval’s identity for Fourier integrals. Relations between fourier and laplace transforms, Multiple finity fourier transform Solution of simple partial differential equations by means of fourier transforms

UNIT - IV

UNIT - V
Application to Boundary value problems: Boundary value problems involving partial differential equations, on dimensional heat conduction equation, one dimensional wave equation, longitudinal and transverse Vibration of a beam, Solution of boundary value problems by laplace transform. Simple boundary value problems with applications of fourier transform.
PROGRAMMING IN C

UNIT - I

UNIT - II

UNIT - III
Decision making and branching: if, else, nested if else, if Ladder, switch statements; ? Operator GOTO operator; Looping statement:- While, do , for Jumps in Loops Arrays, one dimensional arrays, two dimensional array, multidimensional array. Pointers, Declaration of pointer accessing the address of a variable, initiating pointers, accessing a variable through its pointer. Pointer and arrays, pointer and function, pointer and structure.

UNIT - IV
Handling of character strings, declaring and initializing string variables. String Handling functions User defined function form of C-function, Return values & their types, calling a function by value & reference Nesting of function recursion, function with array & structures and union , structure initialization array of structures, structure within structure, structure and function.

UNIT - V
File management in C, Defining & Opening a file, closing a file, Input/output operations on file Error hand I/O operator Random access to the files, Command, line argument Preprocessors- Macro substitution, ANSI editions computer control directives.
FUNDAMENTALS OF COMPUTER SCIENCE

UNIT - I
Principles of object oriented programming object oriented paradigm, Basic concept of object oriented programming, Benefits of OOPs, object oriented language, application of OOPs. Introduction to C++, Structure of Program. Compiling & linking of C++ Program.

UNIT - II
Classes, objects, constructor and Destructor operator overloading and type conversion, Inheritance, single inheritance, Multilevel Inheritance, pointers, virtual functions and polymorphism Templates, class Template, function Templates, New ANSI C++ features object oriented systems development procedure oriented paradigm, Development Tools, object oriented paradigm.

UNIT - III
Introduction to data base systems, operational Data, Data independence, data base system architecture Relational approach to data structures Relations, Domain and attributes, keys, Extension, Relational Data manipulations, Relational Algebra and relational calculus, SQL – basic features, Integrity constraints Database design – Normalization up to BCNF.

UNIT - IV
Data structure – Date types – Classification of data structure linked lists, stalk & Queues, Operation of Lists Stack & Queues, Algorithm for lists stack & Queue Trees properties of tree, Types : - Binary, Binary search, Tree, B-Tree Hashing Techniques Sorting Techniques – Selection sorts Bubble sort, Quick sort, heap sort.

UNIT - V
Operating system, Services, offered classification of O/S Function of O/S process Management, file Management Memory Management I/O Management concept of virtual memory, security threads protection intruders; virus trusted system, Introduction to Distributed systems.