Mathematical Aspects of Seismology (MM-511) (opt. I)

Class-M.sc.(F)(semester-4)
Teacher's Name-Ms. Akshita
Lesson Plan
Session(2020-21)

April week4: General form of progressive waves, Harmonic waves, Plane waves, the wave equation.Principle of superposition. Special types of solutions: Progressive and Stationary type solutions of wave equation. Problems

May week1: Equation of telegraphy. Exponential form of harmonic waves. D' Alembert's formula. Inhomogeneous wave equation. Dispersion: Group velocity, relation between phase velocity and group velocity. Reduction of equation of motion to wave equations. P and S waves and their characteristics

May week2:. Polarisation of plane P and S waves. Snell's law of reflection and refraction. Reflection of plane P and SV waves at a free surface. Partition of reflected energy. Reflection at critical angles.Reflection and reflection of plane P,SV and SH waves at an interface,Test

May week3: . Special cases of Liquid-Liquid interface, Liquid-Solid interface and Solid-Solid interface. Rayleigh waves, Love waves and Stoneley waves. Two dimensional Lamb's problems in an isotropic elastic solid: Area sources and Line Sources in an unlimited elastic solid.

May week4: A normal force acts on the surface of a semi-infinite elastic solid, tangential forces acting on the surface of a semi-infinite elastic solid. Three dimensional Lamb's problems in an isotropic elastic solid: Area sources and Point sources in an unlimited elastic solid

June week1: , Area source and Point source on the surface of semi-infinite elastic solid.Haskell matrix method for Love waves in multilayered medium.

June week2: Spherical waves. Expansion of a spherical wave into plane waves: Sommerfield's integral. Kirchoff's solution of the wave equation,

June week3: Poissons's formula, Helmholtz's formula. Introduction to Seismology: Location of earthquakes

June week4:, Aftershocks and Foreshocks, Earthquake magnitude, Seismic moment, Energy released by earthquakes,

July week1: observation of earthquakes, interior of the earth.

Principal
Arya Kanya Mahavidyalaya
Bhiwani

Practical-IV (MM-512)

Class-M.sc-F(semester-4)
Teacher's Name-Ms. Akshita
Lesson Plan
Session(2020-21)

April week4: problem solving techniques based on papers MM-507 to MM-511

May week1: . Solutions of simultaneous linear equations.

May week2: Solution of algebraic / transcendental equations.

May week3: . Inversion of matrices

May week4: Numerical differentiation and integration

June week1: Solution of ordinary differential equations

June week2: . Statistical problems on central tendency and dispersion
June week3: Fitting of curves by least square method.
June week4: Revision

July week1: Revision

Principal (Offg.)
Arya Kanya Mahavidyalya
Shahabad Markanda

Differential Equations-II-(MM-412)

Class-M.Sc.-I (2nd Semester)

Teacher's Name-Ms. Akshita

Planner

Session -2020-21

April week 4: Linear second order equations: Preliminaries, self adjoint equation of second order, Basic facts, superposition principle, Riccati's equation,

May Week 1: Prüffer transformation, zero of a solution, Oscillatory and non-oscillatory equations. Abel's formula. Common zeros of solutions and their linear dependence.

May Week 2: Sturm theory: Sturm separation theorem, Sturm fundamental comparison theorem and its corollaries. Elementary linear oscillations.

May Week 3: Autonomous systems: the phase plane, paths and critical points, Types of critical points; Node, Center, Saddle point, Spiral point. Stability of critical points. Critical points and paths of linear systems: basic theorems and their applications.

May Week 4: Critical points and paths of non-linear systems: basic theorems and their applications. Liapunov function. Liapunov's direct method for stability of critical points of non-linear systems.

June Week 1: Limit cycles and periodic solutions: Limit cycle, existence and non-existence of limit cycles, Benedixson's non-existence criterion. Half-path or Semiorbit, Limit set, Poincare Benedixson theorem. Index of a critical point.

June Week 2: Second order boundary value problems(BVP): Linear problems; periodic boundary conditions, regular linear BVP, singular linear BVP; non-linear BVP

June Week 3: Sturm-Liouville BVP: definitions, eigen value and eigen function. Orthogonality of functions, orthogonality of eigen functions corresponding to distinct eigen values.

June Week 4: Green's function. Applications of boundary value problems. Use of Implicit function theorem and Fixed point theorems for periodic solutions of linear and non-linear equations.

Dr. (Mrs) Sunita Pahwa

Offg. Principal

Principal (Offg.)
Arya Kanya Mahavidyalya
Shahabad Markanda

Sequences and Series(BM-241)
Class- B.Sc.-11 (semester-1V)
Teacher's Name-Ms. Akshita
Lesson Plan
Session 2020-21

April week 4: Boundedness of the set of real numbers; least upper bound, greatest lower bound of a set, neighborhoods, interior points, isolated points

May Week 1:limit points, open sets, closed set, interior of a set, closure of a set in real numbers and their properties.

May Week 2: Bolzano- Weiestrass theorem, Open covers, Compact sets and Heine-Borel Theorem.

May Week 3: Sequence: Real Sequences and their convergence, Theorem on limits of sequence

May Week 4: Bounded and monotonic sequences, Cauchy's sequence, Cauchy general principle of convergence, Subsequences, Subsequential limits.

June Week 1:Infinite series: Convergence and divergence of Infinite Series, Comparison Tests of positive terms Infinite series, Cauchy' s genera principle of Convergence of series

June Week 2: Convergence and divergence of geometric series, Hyper Harmonic series or p-series. Infinite series: D-Alembert's ratio test, Raabe's test, Logarithmic test, de Morgan and Bertrand's test, Cauchy's Nth root test, Gauss Test, Cauchy's integral test, Cauchy's condensation test.

June Week 3: Alternating series, Leibnitz's test, absolute and conditional convergence, Arbitrary series: abel's lemma, Abel's test, Dirichlet's test, Insertion and removal of parenthesis, re arrangement of terms in a series, Dirichlet's theorem

June Week 4: Riemann's Re-arrangement theorem, Pringsheim's theorem (statement only), Multiplication of series, Cauchy product of series, (definitions and examples only) Convergence and absolute convergence of infinite products.

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Shahabad Markanda

Linear Algebra(MM-362)
Class-B.sc.-III(semester-6)
Teacher's Name-Ms. Anmol
Lesson Plan
Session(2020-21)

April week4: Vector spaces, subspaces, Sum and Direct sum of subspaces, Linear span, Linearly Independent and dependent subsets of a vector space.

May week1: Finitely generated vector space, Existence theorem for basis of a finitely generated vactor space, Finite dimensional vector spaces, Invariance of the number of elements of bases sets,

May week2: Dimensions, Quotient space and its dimension, Homomorphism and isomorphism of vector spaces,Problems

May week3:, Linear transformations and linear forms on vactor spaces, Vactor space of all the linear transformations Dual Spaces, Bidual spaces

May week4: annihilator of subspaces of finite dimentional vactor spaces, Null Space, Range space of a linear transformation, Rank and Nullity Theorem

June week1: Algebra of Liner Transformation, Minimal Polynomial of a linear transformation, Singular and non-singular linear transformations,

June week2: Matrix of a linear Transformation, Change of basis, Eigen values and Eigen vectors of linear transformations,Test

June week3: annihilator of subspaces of finite dimentional vactor spaces, Null Space, Range space of a linear transformation, Rank and Nullity Theorem,Problems

June week4: Inner product spaces, Cauchy-Schwarz inequality, Orthogonal vectors, Orthogonal complements, Orthogonal sets and Basis, Bessel's inequality for finite dimensional vector spaces

July week1:, Gram-Schmidt, Orthogonalization process, Adjoint of a linear transformation and its properties, Unitary linear transformations

Principal (Offg.)
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Shahabad Markanda

Advanced Abstract Algebra-II(MM-407)

Class-M.sc.-P(semester-2)
Teacher's Name-Ms. Anmol
Lesson Plan
Session(2020-21)

April week4: Commutators and higher commutators. Commutators identities. Commutator subgroups.Derived group. Three subgroups Lemma of P.Hall. Central series of a group G. Nilpotentgroups. Centre of a nilpotent group. Subgroups and factor subgroups of nilpotent groups

May week1: .Finite nilpotent groups. Upper and lower central series of a group G and their properties.Subgroups of finitely generated nilpotent groups. Sylow-subgroups of nilpotent groups.Centre of a nilpotent group. Subgroups and factor subgroups of nilpotent groups.Finite nilpotent groups. Upper and lower central series of a group G and their properties.Problems

May week2: Subgroups of finitely generated nilpotent groups. Sylow-subgroups of nilpotent groups. Similar linear transformations. Invariant subspaces of vector spaces. Reduction of a lineartransformation to triangular form. Nilpotent transformations. Index of nilpotency of anilpotent transformation.

May week3: Cyclic subspace with respect to a nilpotent transformation.Uniqueness of the invariants of a nilpotent transformation. Primary decomposition theorem. Jordan blocks and Jordan canonical forms. Cyclic module relative to a linear transformation.

May week4: Companion matrix of a polynomial f(x).Rational Canonicals form of a linear transformation and its elementary divisior.Uniqueness of the elementary divisior.

June week1: Modules, submodules and quotient modules. Module generated by a non-empty subset ofan R-module. Finitely generated modules and cyclic modules. Idempotents.Homomorphism of R-modules.Test

June week2: Fundamental theorem of homomorphism of R-modules.Direct sum of modules. Endomorphism rings EndZ(M) and EndR(M) of a left R-module M. Simple modules and completely reducible modules (semi-simple modules). Finitely generated free modules. Rank of a finitely generated free module

June week3: Submodules of free modules of finite rank over a PID. Endomorphism ring of a finite direct sum of modules,Problems

June week4:. Finitely generated modules Ascending and descending chains of sub modules of an R-module. Ascending and Descending change conditions (A.C.C. and D.C.C.). Noetherian modules and Noetherian rings

July week1: . Finitely co-generated modules. Artinian modules and Artinian rings. Nil andnilpotent ideals. Hilbert Basis Theorem. Structure theorem of finite Boolean rings.Wedeerburn-Artin theorem and its consequences.

General Measure and Integration Theory(MM-507)

Class-Msc.(F)(semester-4)
Teacher's Name-Ms. Anmol
Lesson Plan
Session(2020-21)

April week4: Measures, some properties of measures, outer measures, extension of measures,uniqueness of extension, completion of a measure, the LUB of an increasingly directed family of measures.

May week1: Measurable functions, combinations of measurable functions, limits of measurablefunctions, localization of measurability, simple functions

May week2: Measure spaces, almost everywhere convergence, fundamental almost everywhere,convergence in measure, fundamental in measure, almost uniform convergence,

May week3: Egoroff's theorem, Riesz-Weyl theorem ,Integration with respect to a measure: Integrable simple functions, non-negativeintegrable functions, integrable functions, indefinite integrals,

May week4the monotone convergence theorem, mean convergence : Product Measures: Rectangles, Cartesian product of two measurable spaces, measurablerectangle, sections, the product of two finite measure spaces,Problems

June week1the product of any twomeasure spaces, product of two σ - finite measure spaces; iterated integrals, Fubini's theorem, a partial converse to the Fubini's theorem Signed Measures: Absolute continuity, finite singed measure, contractions of a finite signed measure, purely positive and purely negative sets, comparison of finite measures,Test

June week2: Lebesgue decomposition theorem, a preliminary Radon-Nikodym theorem, Hahn decomposition, Jordan decomposition, upper variation, lower variation, total variation,domination of finite signed measures,Problems

June week3: , the Radyon-Nikodym theorem for a finite measure space, the Radon-Nikodym theorem for a σ - finite measure space, Integration over locally compact spaces: continuous functions with compact support, Gδ's and Fσ's, Baire sets,

June week4: Baire function, Baire-sandwich theorem, Baire measure, Borel sets, Regularity of Baire measures, Regular Borel measures, Integration of continuousfunctions with compact support, Riesz-Markoff's theorem

July week1:Revision

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Shahabad Markanda

BC-205 BUSINESS MATHEMATICS-II

Class-B.com-I(semester-2)
Teacher's Name-Ms. Anmol
Lesson Plan
Session(2020-21)

April week4:

Linear Programming-formulation of LPP: Graphical method of solution; problems relating to two variables including the case of mixed constraints; cases having no solution, multiple solutions;

May week1: unbounded solution and redundant constraints; simplex method - solution of problems up to three variables, including cases of mixed constraints, duality,Problems

May week2: ; Transportation Problem.Test

May week3: Data –introduction,classification and tabulation

May week4: Diagrammatic representation of data

June week1: Graphical representation of data

June week2: Data interpretation,Test

June week3: Permutations

June week4: Combinations,Test

July week1: Binomial theorem

Principal (Offg.)
Arya Kanya Mahavidyalya
Shahabad Markanda

Vector Calculus (BM-123)

Class-B.Sc.-I (2nd Semester)

Teacher's Name-Ms. Ekta

Lesson Plan

Session -2020-21

May: Week 1- Scalar and vector product of three vectors, product of four vectors, reciprocal vectors

May: Week 2-Vector differentiation, scalar valued point functions, vector valued point functions, derivative along a curve

May: Week 3-Directional derivatives, gradient of a scalar point function, character of gradient as a point function, divergence and curl of vector valued function

May: Week 4-characters of div and curl as a vector valued function, examples, Laplacian operator

June: Week 1-orthogonal curvilinear coordinates, conditions for orthogonality fundamental triad of mutually orthogonal unit vectors

June: Week 2-gradient, divergence and curl in terms of orthogonal curvilinear coordinates, cylindrical coordinates

June: Week 3-spherical coordinates, problems related to cylindrical and spherical coordinates

June: Week 4-line integral, surface integral, volume integral, theorems of Gauss, Green& Stokes and problems based on these theorems

Dr. (Mrs) Sunita Pahwa

Offg. Principal

Principal (Offg.)
Arya Kanya Mahavidyalaya
Markanda

Dynamics (BM-363)

Class-B.Sc.-III (6th Semester)

Teacher's Name-Ms. Ekta

Planner

Session -2020-21

May: Week 1-Velocity and acceleration along radial and transverse directions

May: Week 2- Velocity and acceleration along tangential and normal directions

May: Week 3-relative velocity and acceleration, simple harmonic motion

May: Week 4-elastic rings, mass, momentum, force, Newton's law of motion, work, power and energy

June: Week 1-definitions of conservative and impulsive force, motion on smooth and rough plane curves

June: Week 2-projectile motion of a particle in a plane, vector angular velocity

June: Week 3-general motion of a rigid body, central orbits, Kepler's law of motion

June: Week 4-motion of a particle in three dimensional, acceleration in terms of different coordinate systems

Sunita

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Partial Differential Equations (MM-508)

Class-M.Sc.-II (4th Semester)

Teacher's Name-Ms. Ekta

Planner

Session -2020-21

May: Week 1-PDE of kth order, definition, examples and classifications, initial value problem, transport equation homogeneous and non homogeneous, radial solution of laplace equation, fundamental solution, harmonic functions and their properties

May: Week 2-mean value formulas, poisson's equation and its solution, strong maximum principle, uniqueness, local estimates for harmonic functions, liouville's theorem

May: Week 3-harnack's inequality, green's function and its derivation, representation formula using green's function, symmetry of green's function, green's function for half space and for a ball, energy methods, uniqueness, dirichlet's principle

May: Week 4-heat equations, physical interpretation, fundamental solution, integral of fundamental solution, solution of initial value problem, duhamel's principle, non homogeneous heat equation

June: Week 1-mean value theorem for heat equation, strong maximum principle, uniqueness, wave equation, physical interpretation, fundamental solution, d'Alemberts formula, reflection method, euler poisson darboux equation, kirchoff's and poisson's formulas

June: Week 2-solution of non homogeneous wave equation, uniqueness, characteristics of linear, quasilinear, fully non linear first order partial differential equations, Hamilton Jacobi equations,

June: Week 4-differentiation of an integral, absolutely continuous functions, convex functions, jesen's inequality,the Lp spaces, minkowski and holder inequalities, completeness of Lp spaces, Riesz representation theorem

Dr. (Mrs) Sunita Pahwa

Offg. Principal

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Arya Kanya Mahavidyalaya
Shahabad Markanda

Real analysis-II (MM-408)

Class-M.Sc.-I (2nd Semester)

Teacher's Name-Ms. Ekta

Planner

Session -2020-21

May: Week 1-lebesgue outer measure, elementary properties of outer measure, measurable sets and their properties

May: Week 2-lebesgue measure of sets of real numbers, algebra of measurable sets, borel sets and their measurability, characterization of measurable sets in terms of open, closed, F and G sets

May: Week 3-existence of a non measurable set, lebesgue measurable functions, characteristic function, simple functions , approximation of measurable functions by sequence of simple functions

May: Week 4-almost uniform convergence, Egoroff's theorem, Lusin's theorem, convergence in measure, F. Riesz theorem, lebesgue integral, shortcomings of Riemann integral

June: Week 1-lebesgue integral of a bounded function, lebesgue integral as a generalization of the Riemann integral, bounded convergence theorem, lebesgue theorem regarding points of discontinuities of Riemann integrable functions

June: Week 2-integral of a non negative function, fatou's lemma, monotone convergence theorem, integration of series, the general lebesgue integral, lebesgue convergence theorem

June: Week 3-differentiation of non negative functions, vitali's covering lemma, the four dini derivatives, lebesgue differentiation theorem,functions of bounded variation and their representation as difference of monotone functions

June: Week 3-shocks, entropy condition, lax-oleinik formula, weak solutions uniqueness, representation of solutions-separation of variables, plane and travelling wave solutions

June: Week 4-fourier transform, laplace transform, converting non linear into linear PDE, cole hop transform, potential functions, hodograph and legendre transforms

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Arya Kanya Mahavidyalaya
Shahabad Markanda

Ordinary differential equations (BM-122)
Class- B.Sc.-I(2^{nd} Semester)
Teacher's Name- Dr. Hema Sukhija
Lesson Plan
Session-2020-21

April:Week 3 Geometrical meaning of a differential equation, Exact differential equation, integrating factors.

April:Week 4 Questions related to Exact differential equation, First order higher degree equations solvable for x, y, p.

May:Week 1 First order higher degree equations solvable for x, y, p, Lagrange's equation, Clairaut's equation, Equations reducible to Clairaut's form.

May:Week 2 Singular solutions, Orthogonal trajectories in Cartesian coordinates and polar coordinates, Self orthogonal family of curves.

May:Week 3 Linear differential equations with constant coefficients.

May:Week 4 Linear differential equations with constant coefficients, Homogeneous linear ordinary differential equations, Equations reducible to homogeneous.

May:Week 5 and end Linear differential equation of second order, Reduction to normal form, Transformation of the equation by changing the dependent variable/ independent variable.

June:Week 1 Solution by operators of non-homogeneous linear differential equations, Reduction of order of a differential equation, Method of variation of parameters.

June:Week 2 Method of undetermined coefficients, revision and class-test.

June:Week 3 Ordinary simultaneous differential equations, solution of simultaneous differential equations involving operators.

June:Week 4 Simultaneous equation of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$, Total differential equations.

July:Week 1 Condition for $Pdx + Qdy + Rdz = 0$ to be exact, General method of solving $Pdx + Qdy + Rdz = 0$ by taking one variable constant, Method of auxiliary equations. **July:Week 2** Discussion about examination pattern and solution of numerical problems given by students.

Sunita

Dr. (Mrs) Sunita Pahwa
Offg. Principal

Principal (Offg.)
Arya Kanya Mahavidyalya
Shahabad Markanda

Number theory and trigonometry (BM-121)
Class- B.Sc.-I(2^{nd} Semester)
Teacher's Name- Dr. Hema Sukhija
Lesson Plan
Session-2020-21

April:Week 3 Divisibility, G.C.D.(greatest common divisors), L.C.M.(least common multiple), Primes, Fundamental Theorem of Arithemetic.

April:Week 4 Linear Congruences, Fermat's theorem. Wilson's theorem and its converse.

May:Week 1 Linear Diophanatine equations in two variables.

May:Week 2 Complete residue system and reduced residue system modulo m. Euler ϕ function, Euler's generalization of Fermat's theorem. Chinese Remainder Theorem.

May:Week 3 Quadratic residues. Legendre symbols. Lemma of Gauss; Gauss reciprocity law. Greatest integer function [x].

May:Week 4 and end The number of divisors and the sum of divisors of a natural number n (The functions d(n) and s(n)), Moebius function and Moebius inversion formula.

June:Week 1 De Moivre's Theorem and its Applications.

June:Week 2 Expansion of trigonometrical functions, Direct circular and hyperbolic functions and their properties.

June:Week 3 Inverse circular and hyperbolic functions and their properties.

June:Week 4 Logarithm of a complex quantity. **July:Week 1** Gregory's series. Summation of Trigonometry series

Dr. (Mrs) Sunita Pahwa
Offg. Principal

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Arya Kanya Mahavidyalya
Shahabad Markanda

Special functions and integral transforms (BM-242)
Class- B.Sc.-II(4^{th} Semester)
Teacher's Name- Dr. Hema Sukhija
Lesson Plan
Session-2020-21

April:Week 3 Practical application of special functions, Series solution of differential equations: Power series method.

April:Week 4 Power series method and definitions of Beta and Gamma functions, Bessel equation and its solution: Bessel functions and their properties-Convergence, recurrence relations.

May:Week 1 Generating functions of Bessel's functions, Orthogonality of Bessel functions.

May:Week 2 Legendre and Hermite differential equations and their solutions: Legendre and Hermite's functions and their properties.

May:Week 3 Recurrence relations and generating functions, Orthogonality of Legendre and Hermite's polynomials

May:Week 4 and end Rodrigue's formulae for Legendre and Hermite polynomials, Laplace integral representation of Legendre polynomial.

June:Week 1 Laplace transforms: Existence theorem for Laplace transforms, Linearity of the Laplace transforms, Shifting theorems, Laplace transforms of derivatives and integrals.

June:Week 2 Differentiation and integration of Laplace transforms, Convolution theorem.

June:Week 3 Inverse Laplace transforms, convolution theorem, Inverse Laplace transform of derivatives and integrals.

June:Week 4 Solution of ordinary differential equations using Laplace transform.

July:Week 1 Fourier transforms: Linearity property, shifting, modulation. Convolution theorem.

April:Week 1 Fourier transform of derivatives, Relations between Fourier transform and Laplace transform.

July:Week 2 Parseval's identity for Fourier transforms, Solution of differential equations using Fourier transforms.

Dr. (Mrs) Sunita Pahwa
Offg. Principal
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Arya Kanya Mahavidyalya
Shahabad Markanda

Real and Complex Analysis (BM-361)
Class- B.Sc.-III(6^{th} Semester)
Teacher's Name- Dr. Hema Sukhija
Lesson Plan
Session-2020-21

April:Week 3 Jacobians, Beta and Gamma functions.
April:Week 4 Double and triple integrals, Drichlet's integral
May:Week 1 Change of order of integration in double integrals, Basic of Fourier series.
May:Week 2 Fourier's series: Fourier expansion of piecewise monotonic functions, Properties of fourier coefficients, Drichlet's conditions.
May:Week 3 Parseval's identity for Fourier series, Fourier series for even and odd functions.
May:Week 4 and end Half range series, change of intervals, Extended complex plane.
June:Week 1 Stereographic projection of complex numbers.
June:Week 2 Continuity and differentiability of complex functions.
June:Week 3 Analytic functions, Cauchy-Riemann equations, Harmonic functions.
June:Week 4 Mapping by elementary functions: Translation, rotation, Magnification and Inversion, Conformal Mappings.
July:Week 1 Mobius transformations,Fixed points, Cross ratio and inverse points.
July: Week 2 Critical mappings.

Sunita

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Shahabad Markanda

Computer Programming-(MM-409)

Class-M.Sc.-I (2nd Semester)

Teacher's Name-Ms. Kavita

Planner

Session -2020-21

April week 4: Numerical constants and variables arithmetic expressions; input/output

May Week 1: arithmetic expressions; input/output;

May Week 2. arithmetic expressions; input/output;

May Week 3 Logical expressions and control flow;

May Week 4: functions; subroutines; arrays

June Week 1: Format specifications; strings;

June Week 2: array arguments, derived data types.

June Week 3: Processing files; pointers;

June Week 4: modules; FORTRAN 90 features; FORTRAN 95 features.

Dr. (Mrs) Sunita Pahwa

Offg. Principal

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Arya Kanya Mahavidyalya
Shahabad Markanda

Practical-II (MM-412)

Class-M.Sc.-I (2nd Semester)

Teacher's Name-Ms. Kavita

Planner

Session -2020-21

April :Week 4: Calculate the area of a triangle with given lengths of its sides.

Given the centre and a point on the boundary of a circle, find its perimeter and area.

May :Week 1: To check an equation $ax^2+ by^2+2cx+2dy+e=0$ in (x, y) plane with given coefficients for representing parabola/ hyperbola/ ellipse/ circle or else.

May :Week 2: For two given values x and y, verify g*g=a*h, where a, g and h denote the arithmetic, geometric and harmonic means respectively.

May :Week 3: Use IF..THEN...ELSE to find the largest among three given real values.

6 To solve a quadratic equation with given coefficients, without using COMPLEX data type.

May :Week 4: To find the location of a given point (x,y) i) at origin, ii) on x-axis or y-axis iii) in quadrant I, II, III or IV.

To find if a given 4-digit year is a leap year or not.

June :Week 1: To find the greatest common divisor (gcd) of two given positive integers.

To verify that sum of cubes of first m positive integers is same as the square of the sum of these integers.

June :Week 2: Find error in verifying sin(x+y)= sin(x) cos(y)+cos(x)sin(y), by approximating the sin(x) and cos(x) functions from the finite number of terms in their series expansions.

June :Week 3: Use SELECT...CASE to calculate the income tax on a given income at the existing rates.

Dr. (Mrs) Sunita Pahwa

Offg. Principal

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Arya Kanya Mahavidyalya
Shahabad Markanda

Mechanics of Solids (MM-509) (opt. i)

Class-M.sc. (F)(semester-4)
Teacher's Name-Ms. Kavita
Lesson Plan
Session(2020-21)

April week4: Two dimensional problems : Plane stress. Generalized plane stress. Airy stress function. General solution of biharmonic equation, Test

May week1: Stresses and displacements in terms of complex potentials. The structure of functions of $\phi(z)$ and $\psi(z)$. First and second boundary-value problems in plane elasticity.

May week2:. Existence and uniqueness of the solutions. Waves : Propagation of waves in an isotropic elastic solid medium Waves of dilatation and distortion. Problems

May week4: Elastic surface waves : Rayleigh waves and Love waves. Extension : Extension of beams, bending of beams by own weight and terminal couples,;

June week1: Plane waves bending of rectangular beams , of cylindrical bars; Torsional rigidity. Torsion and stress functions.Test

June week2: Torsion : Torsion Lines of shearing stress. Torsion of anisotropic beams; Simple problems related to circle, ellipse and equilateral triangle.

June week3: Variational methods : Theorems of minimum potential energy. Theorems of minimum complementary energy. Reciprocal theorem of Betti and Rayleigh.

June week4: Deflection of elastic string cental line of a beam and elastic membrane. Solution of Euler's equation by Ritz, Galerkin and Kantorovich methods.

July week1: Revision

Mathematical Foundations-1 (B.C.A-124)

Class- B.C..A-1 (Sem-11)

Planner

Session 2020-21

April: week 4 Bridge Course,Propositions and logical operators, truth tables and propositions generated by a set. Equivalence and implications.

May: week 1 laws of logic, Mathematical system, Proposition over a universe, Mathematical induction, Quantifiers.

May: week 2 Binary operations on a non empty set, groups, Subgroups, Normal Subgroups, cosets, Factor groups,Rings,Sub rings, Ideals, factor rings.

May: Week 3 Prime Ideals, Minimal ideal, fields,direct product of groups, isomorphism of groups and rings(definitions and examples only).

May: week 4 Addition and multiplication of matrices, Laws of matrix algebra, Singular and non singular matrices, inverse of a matrix.

June: week 1 rank of a matrix, Rank of the product of two matrices, system of linear equations,i e.AX=0 and AX=B. Characteristics equations of a square matrix.

June: week 2 cayley- Hamilton Theorem,Eigen values and eigen vectors, eigen values and eigen vectors of symmetric,skew-symmetric.

June: week 3 Hermitian and skew-Hermitian matrices,Diagonalization of a square matrix.

June: week 4 Revision

Principal (Offg.)
Arya Kanya Mahavidyalya
Shahabad Markanda

Complex Analysis-11 (MM-410)

Class- M.Sc.(P) (Sem-11)

Planner

Session 2020-21

April: week 4 Bridge Course,Spaces of analytic functions and their completeness, Hurwitz's theorem, Montel'stheorem, Riemann mapping theorem, infinite products

May:week 1 Weierstrass factorization theorem,
Factorization of sine function, Gamma function and its properties, functional equation for

gamma function, Integral version of gamma function.
May: week 2 Reimann-zeta function, Riemann's functional equation, Runge's theorem, Mittag Leffler's theorem.Analytic continuation, uniqueness of direct analytic continuation, uniqueness of analytic continuation along a curve

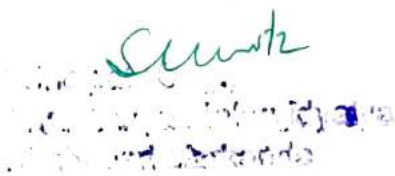
May: Week 3 Power series method of analytic continuation , Schwarz
reflection principle.
May: Week 4 Monodromy theorem and its consequences. Harmonic function as a disk, Poisson's Kernel. Harnack's inequality, Harnack's theorem, Canonical product, Jensen's formula,
Poisson-Jensen formula

June: Week 1 Hadamard's three circle theorem. Dirichlet problem for a unit
disk. Dirichlet problem for a region, Green's function.
Order of an entire function, Exponent of convergence

June: Week 2 Borel theorem, Hadamard'sfactorization theorem. The range of an analytic function, Bloch's theorem, Little-Picardtheorem, Schottky's theorem, Montel-Carathedory theorem, Great Picard theorem.
Univalent functions

June: Week 3 Bieberbach's conjecture (Statement only), and 17/ 4 theorem. Revision

June: week 4 Revision.



Fluid Mechanics-11(MM-510(opt(i))

Class- M.Sc.(F) (Sem-1V)

Planner

Session 2020-21

April: week 4 Bridge Course, Basic of fluid Mechanics

May: Week 1 Fundamental Equations: Derivation of the equations of continuity and equation of motion in cylindrical and spherical coordinates.

May: Week 2 Two–dimentional inviscid incompressible flows, Stream function : Irrotatonal motion in two dimensions, Complex velocity potential. Sources, sinks, doublets and their images. Thomson circle theorem. Two- dimensional irrotational motion produced by motion of circular cylinder.

May: Week 3 Two dimensional motion : Motion due to elliptic cylinder in an infinite mass of liquid, Kinetic energy of liquid contained in rotating elliptic cylinder, circulation about elliptic cylinder.

May: week 4 Theorem of Blasius. Theorem of Kutta and Joukowski. Kinetic energy of a cyclic and acyclic irrotational motion.

June: week 1 Axisymmetric flows, Stoke's stream function,Stoke's stream functions of some basic flows. Three –dimential motion : Motion of a sphere through a liquid at rest at infinity. Liquid streaming past a fixed sphere.Three –dimential motion : Motion of a sphere through a liquid at rest at infinity. Liquid
streaming past a fixed sphere.

June: week 2 Equation of motion a sphere. Alembert's paradox,
impulsive motion, initial motion of liquid contained in the intervening space between two concentric spheres.Vortex motion and its elementary properties. Kelvin's proof of permanence. Motions due to circular and rectilinear vortices. Infinite rowes of line vortices.

June: week 3 Dynamical similarity . Buckingham pi- theorem , Reynolds number. Prandtl's boundary layer.boundary layer equations in two dimensions. Blasius solution Boundary layer.Displacement thickness, Karman integral conditions, separation of boundary layer.

thickness.

June:Week 4 Revision

Principal (Offg.)
Arts Kanya Mahavidyalaya
Shahabad Markanda

Programming in C and Numerical Methods

Class- B.Sc.(11) (Sem-1V)

Planner

Session 2020-21

April:Week 4 Bridge Course, Basic of Programming in C, Programmer's model of a computer.Algorithms.Flow chart.Data Types, Operators and expression.

May: week 1 Input/output, Decisions Control Structure, logical and conditional statements, Implementation of loops, switch statement and case control structures.

May: week 2 Functions, preprocessors and Arrays. Strings: Character data type, Standard string handling functions, arithmetic operations on characters. Structures: Definition,using Structures, use of structures in arrays and Arrays in structures.

May: week 3 Pointers data type,pointers and Arrays, pointers and functions.solution of algebraic and transcendental equations.

May: Week 4 Newton's iterative method for finding pth root of a number, order of convergence of above methods.

June: week 1 Simultaneous linear algebraic equations: Gauss-elimination method, Gauss- Jordan method, Triangularization method .

June: week 2 Crout's method .cholesky decomposition method. Iterative method,jacobi's method,Gauss-seidal's method, Relaxation method.

June: week 3 Revision

Principal (Offg.)
Arya Kanya Mahavidyalya
Shahabad Markanda