Vedang Institute of Technology
Lesson Plan

Discipline: Mechanical Engineering	**Semester: 2nd**	**Name of the Teaching Faculty: LINA MAHANTA**
Subject: Engineering Mathematics -II	**No. of days/Per weeks Class Allotted Weeks 5**	**Semester from date: 29/01/2024 to 14/05/2024** **No of Weeks: 15**
Weeks	**Class day**	Theory
1st	1st	Introduction to vectors
	2nd	Types of vectors (null, unit, parallel, etc.)
	3rd	Representation of vectors in component form
	4th	Magnitude and direction
	5th	Addition and subtraction of vectors
2nd	1st	Position vector
	2nd	Scalar (dot) product
	3rd	Geometrical meaning of dot product
	4th	Angle between two vectors
	5th	Scalar projection
3rd	1st	Vector projection
	2nd	Vector (cross) product
	3rd	Geometrical meaning of cross product
	4th	Area of triangle using vectors
	5th	Area of parallelogram using vectors
4th	1st	Definition of function (set theory-based)
	2nd	Types of functions (constant, identity)
	3rd	Absolute value, greatest integer function
	4th	Trigonometric and exponential functions
	5th	Logarithmic function
5th	1st	Introduction to limits
	2nd	Existence of limits
	3rd	Standard limits (formulas)
	4th	Evaluation of limits using formulas
	5th	Continuity at a point and related problems
6th	1st	Derivative at a point
	2nd	Algebra of derivatives
	3rd	Derivatives of standard functions – part 1
	4th	Derivatives of standard functions – part 2
	5th	Problems on derivatives of standard functions
7th	1st	Chain rule and composite function
	2nd	Parametric differentiation
	3rd	Implicit differentiation
	4th	Logarithmic differentiation
	5th	Problems on mixed methods

8th	1st	Derivatives of function w.r.t. another function
	2nd	Successive differentiation (up to 2nd order)
	3rd	Partial differentiation (up to 2nd order)
	4th	Applications of derivatives
	5th	Practice problems on all concepts
9th	1st	Concept of integration as inverse of differentiation
	2nd	Standard integrals
	3rd	Integration by substitution
	4th	Integration by parts
	5th	Practice problems
10th	1st	$\int \frac{dx}{x^2+a^2}, \int \frac{dx}{a^2-x^2}, \int \frac{dx}{x^2-a^2}$
	2nd	$\int \frac{dx}{\sqrt{x^2+a^2}}, \int \frac{dx}{\sqrt{a^2-x^2}}$
	3rd	$\int \frac{dx}{\sqrt{x^2-a^2}} \int \frac{\sqrt{a^2-x^2}}{x} dx$
	4th	$\int \sqrt{x^2+a^2}dx, \int \sqrt{x^2-a^2}dx$
	5th	Practice problems on these forms
11th	1st	Definite integral – definition
	2nd	Properties of definite integrals (i, ii)
	3rd	Properties (iii, iv)
	4th	Mixed problem-solving
	5th	MCQs/Practice test
12th	1st	Area under a curve (introduction)
	2nd	Area between curve and X-axis
	3rd	Area of a circle with centre at origin
	4th	Combined application problems
	5th	Problem-solving session
13th	1st	Order and degree of differential equation
	2nd	Formation of DEs
	3rd	Solution of 1st order, 1st degree (separation of variables)
	4th	Practice problems on separable DEs
	5th	Word problems based on separable DEs
14th	1st	Linear differential equations form $\frac{dy}{dx} + Py = Q$
	2nd	Integrating factor method

	3rd	Solving linear DEs
	4th	Application-based problems
	5th	Mixed problem-solving on DE
15th	1st	Revision: Vector Algebra & Limits
	2nd	Revision: Derivatives
	3rd	Revision: Integration
	4th	Revision: Differential Equations
	5th	Internal Assessment / Test / Viva

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VEDANG INSTITUTE OF TECHNOLOGY, MALIPADA, KHURDA

DIPLOMA LESSON PLAN
Session (2023-2024)

Discipline: Mechanical Engineering	**Semester: 2nd**	**Name of the Faculty:** Namtaz Pradhan
Subject: Computer Application, Theory-1b	**No. of Days/week:** 04	**Start Date:** 29/01/2024 **End Date:** 14/05/2024

Week	Class Day	Theory Topics
1st	1st	**COMPUTER ORGANISATION:** Introduction to Computer
	2nd	Evolution & Generation of Computers
	3rd	Classification of Computers
	4th	Basic Organization of Computer (Functional Block diagram)
2nd	1st	Input Devices, CPU & Output Devices
	2nd	Computer Memory and Classification of Memory
	3rd	Question Answer discussion
	4th	**COMPUTER SOFTWARE:** Software concept, System software, Application software
3rd	1st	Overview of Operating System Objectives and Functions of OS
	2nd	Types of Operating System: Batch Processing, Multiprogramming, Time Sharing OS
	3rd	Features of DOS, Windows and UNIX
	4th	Programming Languages Compiler, interpreter
4th	1st	Computer Virus Different Types of computer virus Detection and prevention of Virus
	2nd	Application of computers in different Domain
	3rd	Quiz Test
	4th	**COMPUTER NETWORK AND INTERNET:** Networking concept, Protocol
5th	1st	Connecting Media
	2nd	Data Transmission mode
	3rd	Network Topologies
	4th	Types of Networks

6th	1st	Networking Devices like Hub, Repeater, Switch, Bridge, Router, Gateway & NIC
	2nd	Internet Services like E-Mail, WWW, FTP, Chatting, Internet Conferencing, Electronic Newspaper & Online Shopping
	3rd	Different types of Internet connectivity and ISP
	4th	Revision
7th	1st	**FILE MANAGEMENT AND DATA PROCESSING:** Concept of File and Folder
	2nd	File Access and Storage methods. Sequential, Direct, ISAM
	3rd	File Access and Storage methods. Sequential, Direct, ISAM (contd...)
	4th	Data Capture, Data storage
8th	1st	Data Processing and Retrieval
	2nd	Question Answer discussion
	3rd	**PROBLEM SOLVING METHODOLOGY:** Algorithm, Pseudo code and Flowchart
	4th	Generation of Programming Languages
9th	1st	Structured Programming Language
	2nd	Examples of Problem solving through Flowchart
	3rd	Revision
	4th	**OVERVIEW OF C PROGRAMMING LANGUAGE:** Introduction to C program
10th	1st	Constants, Variables
	2nd	Data types in C
	3rd	Managing Input and Output operations and header files
	4th	Structure of a typical C program
11th	1st	Operators
	2nd	Type conversion & Typecasting
	3rd	Programs related to above concept.
	4th	Decision Control statement in C
12th	1st	Programs related to Control statement
	2nd	Programs related to Control statement (contd...)
	3rd	Programs related to Control statement (contd...)
	4th	Loop Statements in C
13th	1st	Programs related to loop
	2nd	Programs related to loop (contd...)
	3rd	Revision
	4th	**ADVANCED FEATURES OF C:** Array
14th	1st	One Dimensional Array and Multidimensional Array
	2nd	Quiz Test

	3rd	Functions and Passing Parameters to the Function (Call by Value and Call by Reference)
	4th	Recursion Function and Types of Recursion
15th	1st	String Operations
	2nd	Pointers Pointer Expression and Pointer Arithmetic
	3rd	Structure and Union (Only concepts)
	4th	Discussion of previous year questions

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VEDANG INSTITUTE OF TECHNOLOGY
KHURDA, BHUBANESWAR

DIPLOMA LESSON PLAN
Session (2023-2024)

Discipline: Mechanical	**Semester: 2nd**	**Name of the Faculty:** Lina Mahanta
Subject: Engineering physics	**No. of Days/week:** 04	**Start Date:** 29/01/2024 **End Date:** 14/05/2024

Week	Class Day	Theory Topics
1st	1st	Introduction to: Engineering Physics and its syllabus, Question paper pattern and motivation
	2nd	Unit-I: UNIT & DIMENSIONS Physical quantities, Units, types of units and system of units
	3rd	Unit-I: UNIT & DIMENSIONS Dimension and dimensional formulae of physical quantities
	4th	Unit-I: UNIT & DIMENSIONS Principle of homogeneity and application of dimensional analysis
2nd	1st	Revision
	2nd	Unit-2: SCALARS AND VECTORS Concept of scalar and vector quantities with definition, types of vectors, Rules of vector addition: Statements of Triangle law of vector addition
	3rd	Unit-2 SCALARS AND VECTORS Parallelogram law of vector addition and simple numerical, Concept on Resolution of vectors with simple numerical on Horizontal and vertical components
	4th	Unit-2: SCALARS AND VECTORS Vector multiplication: Dot product and Cross Product with simple numerical on dot and cross products
3rd	1st	Unit-3: KINEMATICS Concept of Rest and Motion with examples, Fundamental ideas on distance, displacement, speed, velocity, acceleration and force, equations of motion under gravity both for upward and downward motion
	2nd	Unit-3: KINEMATICS Circular motion: Conceptual idea on circular motion and terms related to circular motion such as angular displacement, angular velocity and angular acceleration
	3rd	Unit-3: Kinematics Derivations of Relation between- (i) Linear & angular velocity, (ii) Linear & Angular acceleration
	4th	Unit-3 KINEMATICS Projectile motion: Definition and examples, Expression for equation of Trajectory, Time of Flight, Maximum Height and Horizontal Range for a projectile fired at an angel, condition for maximum horizontal range with simple numerical

4th	1st	Revision
	2nd	Quiz Test
	3rd	Unit-4 WORK AND FRICTION Definition of work, its formula and Sl unit with simple numerical
	4th	Unit-4 WORK AND FRICTION Concept of friction with definition and simple examples, Types of friction
5th	1st	Unit-4 WORK AND FRICTION Definition with concept on limiting friction, and laws of limiting friction (statement only)
	2nd	Unit-4: WORK AND FRICTION Theory on Coefficient of Friction and simple numerical
	3rd	Unit-4: WORK AND FRICTION Methods to reduce friction with examples
	4th	Unit-5: GRAVITATION Introduction, a detail explanation on Newton's Laws of Gravitation
6th	1st	Unit-5: GRAVITATION Definition of Universal Gravitational Constant (G) with its unit and dimensions
	2nd	Unit-5•. GRAVITATION Definition and concept of acceleration due to gravity (g), Relation between 'g' and 'G' and definition of mass and weight
	3rd	Unit-5: GRAVITATION Explanation (No derivation) on variation of 'g' with altitude and depth, statements on Kepler's Laws of Planetary motion
	4th	Quiz Test
7th	1st	Unit-6: OSCILLATIONS AND WAVES Definition and examples on Simple Harmonic Motion (SHM), expressions for displacement, velocity and acceleration of a body or article in SHM
	2nd	. Unit-6: OSCILLATIONS AND WAVES Wave Motion (Definition & Concept), Transverse and Longitudinal wave motion (Definition, examples and Comparison
	3rd	Unit-6: OSCILLATIONS AND WAVES Wave parameters and establish a relation between velocity, frequency and Time period, Ultrasonic- Definition, properties &Applications
	4th	Unit-7: HEAT AND THERMODYNAMICS Heat & temperature- Definition and difference, Units of Heat (FPS, CGS, MKS & SD
8th	1st	Unit-7: HEAT AND THERMODYNAMICS Fundamental ides on Specific heat, Change of State and Latent Heat with simple numerical
	2nd	Unit-7: HEAT AND THERMODYNAMICS Concept on Thermal expansion and Coefficient of linear (a), superficial (ß) and cubical (y) expansions of Solids
	3rd	Unit-7: HEAT AND THERMODYNAMICS Definition and Relation between Work and Heat, Joule's Mechanical Equivalent of Heat, Statement and explanation on 1st Law of thermodynamics
	4th	Quiz Test
9th	1st	Unit-8: OPTICS Concept of Reflection and laws of Reflection, Concept of Refraction and laws of Refraction and Refractive index (Definition, formula and Simple numerical)
	2nd	Unit-8: OPTICS Concept and Explanation of Total Internal Reflection and Critical angle
	3rd	Unit-8: OPTICS Definition, Properties and Applications on Fiber Optics

	4th	Revision
10th	1st	Quiz Test
	2nd	Unit-9:: ELECTROSTATICS AND MAGNETOSTATICS Concept of Electric field and Electric field intensity, Statement and Explanation of Coulomb's law and definition of Unit charge, Absolute & Relative Permittivity (Definition, Relation & Unit),
	3rd	Unit-9: ELECTROSTATICS AND MAGNETOSTATICS Electric potential & Electric potential difference (Definition, formula & SI units), Concept of capacitor and capacitance, Series and parallel combination of capacitors: Formula for e univalent ca acutance and sim le numerical
	4th	Unit-9: ELECTROSTATICS AND MAGNETOSTATICS Fundamental idea on magnet, Coulomb's law in magnetism and definition of Unit pole
11th	1st	Unit-9: ELECTROSTATICS AND MAGNETOSTATICS Definition of magnetic field and Magnetic field Intensity (H) with its formula and Sl unit, Magnetic lines of force Definition and Properties
	2nd	Unit-9: ELECTROSTATICS AND MAGNETOSTATICS Magnetic flux(cp) and Magnetic flux density
	3rd	Revision
	4th	Quiz Test
12th	1st	Unit-10: CURRENT ELECTRICIIY Introduction to Electric Current, Ohm's law and its applications
	2nd	Unit-10: CURRENT ELECTRICITY Series and parallel combination of resistors: Formula for equivalent resistance and simple numerical
	3rd	Unit-10: CURRENT ELECTRICITY Kirchhoff's laws: Statements & Explanation with diagram
	4th	Unit-10: CURRENT ELECTRICIN Application of Kirchhoff's law- Derivation of condition of balance of Wheatstone bridge
13th	1st	Revision
	2nd	Quiz Test
	3rd	Unit-11: ELECTROMAGNETISM AND ELECTROMAGNETIC INDUCTION Introduction, Force acting on a current carrying conductor placed in a uniform magnetic field, Fleming's left-hand rule
	4th	Unit-11: ELECTROMAGNETISM AND ELECTROMAGNETIC INDUCTION Statement on Faraday's Laws of Electromagnetic Induction & Lenz's law
14th	1st	Unit-11: ELECTROMAGNETISM AND ELECTROMAGNETIC INDUCTION Fleming's Right Hand Rule, Comparison between Fleming's Right-hand rule & Left hand rule
	2nd	Revision

	3rd	Quiz Test
	4th	Unit-12: MODERN PHYSICS Introduction to LASER and laser beam, its principle: Population inversion & Optical Pumping
15th	1st	Unit-12: MODERN PHYSICS Concept on Wireless Transmission- Ground waves, Sky waves & S ace Waves
	2nd	Revision
	3rd	Quiz Test
	4th	Discussion of previous year questions

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Vedang Institute of Technology
LESSON PLAN

Discipline: Electrical & Electronics Engg	**Semester: 2nd**	Name of the Teaching Faculty: **Soumyashree Senapati**
Subject : Engineering Mechanics	**No. of days/Per weeks Class Allotted Weeks :4**	**Semester from date: 29/01/2024 to 14/05/2024 No. of Weeks: 15**
Weeks	**Class Days**	Theory
1st	1st	Fundamentals. Definitions of Mechanics, Statics, Dynamics, Rigid Bodies,
	2nd	Force System, Classification of force system according to plane & line of action.
	3rd	Definition, Classification of force system according to plane & line of action. Characteristics of Force & effect of Force. Principles of Transmissibility & Principles of Superposition. Action & Reaction Forces & concept of Free Body Diagram.
	4th	Resolution of a Force. Definition, Method of Resolution, Types of Component forces, Perpendicular components & non-perpendicular components.
2nd	1st	Composition of Forces. Definition, Resultant Force, Method of composition of forces, such as 1.4.1 Analytical Method such as Law of Parallelogram of forces & method of resolution.
	2nd	Graphical Method. Introduction, Space diagram, Vector diagram, Polygon law of forces.
	3rd	Resultant of concurrent, non-concurrent & parallel force system by Analytical & Graphical Method.
	4th	Moment of Force. Definition, Geometrical meaning of moment of a force, measurement of moment of a force & its S.I units. Classification of moments according to
3rd	1st	direction of rotation, sign convention, Law of moments, Varignon's Theorem, Couple – Definition, S.I. units, measurement of couple, properties of couple.
	2nd	Definition, condition of equilibrium
	3rd	Analytical & Graphical conditions of equilibrium for concurrent,
	4th	non-concurrent & Free Body Diagram
4th	1st	Lamia's Theorem
	2nd	Statement,
	3rd	Application for solving various engineering
	4th	Application for solving various engineering
5th	1st	Definition of friction, Frictional forces,
	2nd	Limiting frictional force,
	3rd	Coefficient of Friction
	4th	Angle of Friction & Repose
6th	1st	Laws of Friction, Advantages & Disadvantages of Friction.
	2nd	Equilibrium of bodies on level plane – Force applied on horizontal & inclined plane (up &down).
	3rd	Ladder, Wedge Friction.

	4th	Ladder, Wedge Friction.
7th	1st	Centroid – Definition, Moment of an area about an axis
	2nd	Centroid – Definition, Moment of an area about an axis
	3rd	centroid of geometrical figures such as squares, rectangles, triangles, circles, semicircles & quarter circles, centroid of composite figures.
	4th	centroid of geometrical figures such as squares, rectangles, triangles, circles, semicircles & quarter circles, centroid of composite figures.
8th	1st	centroid of geometrical figures such as squares, rectangles, triangles, circles, semicircles & quarter circles, centroid of composite figures.
	2nd	Moment of Inertia – Definition, Parallel axis & Perpendicular axis Theorems. M.I. of plane lamina & different engineering sections.
	3rd	Moment of Inertia – Definition, Parallel axis & Perpendicular axis Theorems. M.I. of plane lamina & different engineering sections.
	4th	Moment of Inertia – Definition, Parallel axis & Perpendicular axis Theorems. M.I. of plane lamina & different engineering sections.
9th	1st	Definition of simple machine,
	2nd	Definition of simple machine,
	3rd	velocity ratio of simple and compound gear train, explain simple & compound lifting machine, define M.A, V.R. & Efficiency & State the relation between them,
	4th	velocity ratio of simple and compound gear train, explain simple & compound lifting machine, define M.A, V.R. & Efficiency & State the relation between them,
10th	1st	velocity ratio of simple and compound gear train, explain simple & compound lifting machine, define M.A, V.R. & Efficiency & State the relation between them,
	2nd	State Law of Machine, Reversibility of Machine, Self Locking Machine.
	3rd	State Law of Machine, Reversibility of Machine, Self Locking Machine.
	4th	Study of simple machines – simple axle & wheel, single purchase crab winch & double purchase crab winch, Worm & Worm Wheel, Screw Jack.
11th	1st	Study of simple machines – simple axle & wheel, single purchase crab winch & double purchase crab winch, Worm & Worm Wheel, Screw Jack.
	2nd	Types of hoisting machine-like derricks etc, their use and working principle. No problems.
	3rd	Types of hoisting machine-like derricks etc, their use and working principle. No problems.
	4th	Types of hoisting machine-like derricks etc, their use and working principle. No problems.
12th	1st	Kinematics & Kinetics, Principles of Dynamics,
	2nd	Kinematics & Kinetics, Principles of Dynamics,
	3rd	Newton's Laws of Motion, Motion of Particle acted upon by a constant force, Equations of motion

	4th	Newton's Laws of Motion, Motion of Particle acted upon by a constant force, Equations of motion
13th	1st	De Alembert's Principle.
	2nd	De Alembert's Principle.
	3rd	Work, Power, Energy & its Engineering Applications,
	4th	Work, Power, Energy & its Engineering Applications,
14th	1st	Kinetic & Potential energy & its application.
	2nd	Kinetic & Potential energy & its application.
	3rd	Kinetic & Potential energy & its application.
	4th	Momentum & impulse,
15th	1st	conservation of energy & linear momentum, collision of elastic bodies, and Coefficient of Restitution.
	2nd	conservation of energy & linear momentum, collision of elastic bodies, and Coefficient of Restitution.
	3rd	conservation of energy & linear momentum, collision of elastic bodies, and Coefficient of Restitution.
	4th	conservation of energy & linear momentum, collision of elastic bodies, and Coefficient of Restitution.
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