LESSON PLAN

Name of Faculty		Ankush Bharti
Department		Applied Science & Humanities
Semester		2nd
Subject		Engineering Mechanics
Lesson Plan for the Duration		29 Jan to 25 May 2024
Week	Topic	Theory
1st (29 Jan - 03 Feb)	Basics of mechanics and force system	Significance and relevance of Mechanics, Applied mechanics, Statics, Dynamics. Space, time, mass, particle, flexible body and rigid body. Scalar and vector quantity, Units of measurement (SI units) - Fundamental units and derived units.
2nd (05 Feb-12 Feb)	Basics of mechanics and force system	Force – unit, representation as a vector and by Bow's notation, characteristics and effects of a force, Principle of transmissibility of force, Force system and its classification.
3rd (13 Feb-19 Feb)	Basics of mechanics and force system	Resolution of a force - Orthogonal components of a force, moment of a force, Varignon's Theorem. Composition of forces – Resultant, analytical method for determination of resultant for concurrent, non-concurrent and parallel co-planar force systems. Law of triangle, parallelogram and polygon of forces.
4th (20 Feb -27 Feb)	Equilibrium	Equilibrium and Equilibrant, Free body and Free body diagram, Analytical and graphical meth-ods of analyzing equilibrium. Lami's Theorem – statement and explanation, Application for various engineering problems
5th (28 Feb-05 Mar)	Equilibrium	Types of beam, supports (simple, hinged, roller and fixed) and loads acting on beam (vertical point load, uniformly distributed load), Beam reaction for cantilever,
6th (06 Mar-14 Mar)	Equilibrium	Simply supported beam with or without overhang – subjected to combination of Point load and uniformly distributed load. Beam reaction graphically for simply supported beam subjected to vertical point loads only.
7th (15 Mar - 21 Mar)	Friction	Friction and its relevance in engineering, types and laws of friction, limiting equilibrium, limiting friction, co-efficient of friction, angle of friction, angle of repose, relation between co-efficient of friction and angle of friction.
8th (22 Mar - 30 Mar)	Friction	Equilibrium of bodies on level surface subjected to force parallel and inclined to plane. Equilibrium of bodies on inclined plane subjected to force parallel to the plane only.
9th (01 Apr -06 Apr)	Centroid and centre of gravity	Centroid of geometrical plane figures (square, rectangle, triangle, circle, semi-circle, quarter circle). Centroid of composite figures composed of not more than two geometrical figures.
10th (08 Apr -18 Apr)	Centroid and centre of gravity	Centre of Gravity of simple solids (Cube, cuboid, cone, cylinder, sphere, hemisphere)
11th (19 Apr - 25 Apr)	Centroid and centre of gravity	Centre ofGravity of composite solids composed of not more than two simple solids.
12th (26 Apr - 02 May)	Simple lifting machine	Simple lifting machine, load, effort, mechanical advantage, applications and advantages. Velocity ratio, efficiency of machines, law of machine.
13th (03 May - 09 May)	Simple lifting machine	Ideal machine, friction in machine, maximum Mechanical advantage and efficiency, reversible and non-reversible machines, conditions for reversibility.
14th (20 May - 25 May)	Simple lifting machine	Velocity ratios of Simple axle and wheel, Differential axle and wheel, Worm and worm wheel, Simple screw jack.

Signature of Subject Teacher

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LESSON PLAN

Name of Faculty	Ankush Bharti
Department	Applied Science & Humanities
Semester	2nd
Subject	Applied Physics-II
Lesson Plan for the Duration	29 Jan to 25 May 2024

Week	Topic	Theory
1st (29 Jan - 03 Feb)	Wave Motion & Its applications	Wave motion, transverse and longitudinal waves with examples, definitions of wave velocity, frequency and wave length and their relationship, Sound and light waves and their properties, wave equation ($y = r\sin \omega t$) amplitude, phase, phase difference, Principle of superposition of waves and beat formation.
2nd (05 Feb-12 Feb)	Wave Motion & Its applications	Simple Harmonic Motion (SHM): definition, expression for displacement, velocity, acceleration, time period, frequency etc.Free, forced and resonant vibrations and their examples. Acoustics of buildings – reverberation, reverberation time, echo, noise, coefficient of absorption of sound, methods to control reverberation time and their applications. Ultrasonic waves – Introduction and properties, engineering and medical applications of ultrasonic.
3rd (13 Feb-19 Feb)	Optics	Basic optical laws- reflection and refraction, refractive index, Images and image formation by mirrors, lens and thin lenses, lens formula, power of lens, magnification. Total internal reflection, Critical angle and conditions for total internal reflection, applications of total internal reflection in optical fiber.
4th (20 Feb -27 Feb)	Optics	Optical Instruments- simple and compound microscope, astronomical telescope in normal adjustment and their magnifying powers.
5th (28 Feb-05 Mar)	Electrostatics	Coulomb's law, unit of charge. Electric field, Electric lines of force and their properties. Electric flux, Electric potential and potential difference.
6th (06 Mar-14 Mar)	Electrostatics	Gauss's law, Capacitor and its working, Capacitance and its units. Capacitance of a parallel plate capacitor, Series and parallel combination of capacitors (related numerical), dielectric and its effect on capacitance, dielectric break down
7th (15 Mar - 21 Mar)	Current Electricity	Electric Current and its units, Direct and alternating current. Resistance and its units, Specific resistance, Conductance, Specific conductance, Series and parallel combination of resistances. Factors affecting resistance of a wire, carbon resistances and colour coding. Ohm's law and its verification.
8th (22 Mar - 30 Mar)	Current Electricity	Kirchhoff's laws. Concept of terminal potential difference and Electro motive force (EMF) Heating effect of current, Electric power, Electric energy and its units (related numerical problems), Advantages of Electric Energy over other forms of energy.
9th (01 Apr -06 Apr)	Electromagnetism	Types of magnetic materials: dia, para and ferromagnetic with their properties. Magnetic field and its units, magnetic intensity, magnetic lines of force, magnetic flux and units, magnetization.
10th (08 Apr -18 Apr)	Electromagnetism	Lorentz force (force on moving charge in magnetic field), Force on current carrying conductor. Moving coil galvanometer; principle, construction and working. Conversion of a galvanometer into ammeter and voltmeter.
11th (19 Apr - 25 Apr)	Semiconductor Physics	Energy bands in solids, Types of materials (insulator, semi-conductor, conductor), intrinsic and extrinsic semiconductors. p-n junction, junction diode and V-I characteristics.
12th (26 Apr - 02 May)	Semiconductor Physics	Diode as rectifier – half wave and full wave rectifier (centre taped). Photocells, Solar cells; working principle and engineering applications.
13th (03 May - 09 May)	Modern Physics	Lasers: Energy levels, ionization and excitation potentials; spontaneous and stimulated emission; population inversion, pumping methods, optical feedback. Types of lasers; Ruby, He-Ne and semiconductor, laser characteristics,engineering and medical applications of lasers.
14th (20 May - 25 May)	Modern Physics	Fiber Optics: Introduction to optical fibers, light propagation, acceptance angle and numerical aperture,fiber types, applications in; telecommunication, medical and sensors.

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