GOVT COLLEGE ROPAR
PHYSICS DEPARTMENT
SESSION 2019-2020

Class: B Sc 1 (Sem 1)
Subject: Mechanics-I
Tentative lesson plan from August 2019 to November 2019
Two weeks left for MST tentative and one week for revision/queries for MST.

TIME PERIOD	TOPICS TO BE COVERED
Week 1	Cartesian and spherical polar co-ordinate systems, area, volume in these systems
Week 2	Displacement ,velocity and acceleration in Cartesian and Spherical polar coordinate system
Week 3	Solid angle, Various forces in Nature(brief introduction),
Week 4	Centre of mass, Equivalent one body problem
Week 5	Central forces, Equation of motion under central force,
Week 6	Equation of orbit in inverse square Force field and turning points
Week 7	Kepler laws and their derivations
Week 8	Relationship of conservation laws and symmetries of space and time .
Week 9	Inertial frame of reference, Coriolis force and its applications
Week 10	Variation of acceleration due to gravity with latitude
Week 11	Focault pendulum (qualitative).
Week 12	Elastic collision in Laboratory and C.M.system,
Week 13	Cross section of elastic scattering. Rutherford scattering (qualitative).

26/07/2019

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PHYSICS DEPARTMENT
SESSION 2019-2020

B.Sc.1 (Sem I)

Subject: Vibration and Waves I

Tentative lesson plan from August 2019 to November 2019

Two weeks left for MST tentative and one week for revision/queries for MST.

TIME PERIOD	TOPICS TO BE COVERED
Week 1	Simple harmonic motion, energy of a Simple Harmonic Oscillation (SHO).
Week 2	Compound pendulum, Electrical oscillations.
Week 3	Transverse vibrations of a mass on a string, composition of two perpendicular SHM of same period and of period ratio 1 : 2.
Week 4	Anharmonic oscillations. Decay of free vibrations due to damping.
Week 5	Differential equation of motion, types of damping.
Week 6	Determination of damping co-efficient-logarithmic decrement,
Week 7	relaxation time and Q-Factor. Electromagnetic damping (Electrical oscillator).
Week 8	Differential equation for forced mechanical and electrical oscillators.
Week 9	Transient and steady state oscillation. Displacement and velocity variation with driving force frequency
Week 10	Variation of phase with frequency resonance,
Week 11	Power supplied to an oscillator and its variation with frequency
Week 12	Q value of a forced oscillator and band width
Week 13	Q-value as an amplication factor of low frequency response.

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PHYSICS DEPARTMENT

SESSION 2019-2020

B.Sc.1 (Sem I)

Subject: Electricty And Magnetism-I

Tentative lesson plan from August 2019 to November 2019

Two weeks left for MST tentative and one week for revision/queries for MST.

TIME PERIOD	TOPICS TO BE COVERED
Week 1	Basic ideas of vector calculus, Gradient, Divergence, curl and their physical significance
Week 2	Coulomb's law in vector form, long uniformly charged wire, Charged disc.
Week 3	Stokes's theorem and its applications in electrostatic field, Curl E= 0. Electric field as gradient of scalar potential.
Week 4	Calculation of E due to a point charge and dipole from potential.
Week 5	Potential due to arbitrary charge distribution and multipole moments
Week 6	Poission and Laplace's equations and their solutions in Cartesian and concept of electrical images.
Week 7	Calculation of electric potential and field due a point charge placed near an infinitely conducting sheet.
Week 8	Current and current density, equation of continuity Microscopic form of Ohm's Law. ($J=\sigma E$) and conductivity. Failure of Ohm's Law
Week 9	Field of a point charge moving with constant velocity. Interaction between moving charges and force between parallel currents.
Week 10	Differential equation for forced mechanical and electrical oscillators. Transient and steady state oscillation.
Week 11	Displacement and velocity variation with driving force frequency, variation of phase with frequency resonance,
Week 12	Power supplied to an oscillator and its variation with frequency, Q value of a forced oscillator
Week 13	band width. Q-value as an amplication factor of low frequency response.

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GOVT COLLEGE ROPAR
PHYSICS DEPARTMENT
SESSION 2019-2020

Class: B Sc 1 (Sem II)

Subject: Mechanics-II

Tentative lesson plan from Feb 2020 to May 2020

Two weeks left for MST tentative and one week for revision/queries for MST.

TIME PERIOD	TOPICS TO BE COVERED
Week 1	Rigid body motion: Rotational motion
Week 2	Principal moments and axes. Euler's equations;
Week 3	Precession and elementary gyroscope.
Week 4	Galilean transformation and Invariance, Non-Inertial frames,.
Week 5	Concept of stationary universal frame of reference and ether.
Week 6	Michelson-Morley experiment and its result
Week 7	Postulates of special theory of relativity. Lorentz transformations
Week 8	Observer and viewer in relativity. Relativity of simultaneity.
Week 9	Length, Time, Velocities, Relativistic Doppler effect
Week 10	Variation of mass with velocity,
Week 11	mass-energy equivalence, rest mass in an inelastic collision,
Week 12	Relativistic momentum and energy, their transformation,
Week 13	Concepts of Minkowski space, four vector formulation.

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PHYSICS DEPARTMENT
SESSION 2019-2020

B.Sc.1 (Sem II)

Subject: Vibration and Waves-II

Tentative lesson plan from Feb 2020 to May 2020

Two weeks left for MST tentative and one week for revision/queries for MST..

TIME PERIOD	TOPICS TO BE COVERED
Week 1	Stiffness coupled oscillators. Normal co-ordinates and normal modes of vibration. Inductance coupling of electrical oscillators,
Week 2	Types of waves, Wave equation (transverse) and its solution,
Week 3	The string as a forced oscillator, Characteristic impedance of a string.
Week 4	Impedance matching. Reflection and transmission of energy,
Week 5	Reflection and Transmission Energy,Reflection and transmission of string,
Week 6	wave and group velocity ,Standing waves on a string of fixed length.
Week 7	Energy of vibrating energy string,wave and group velocity. Physical interpretation of Maxwell's equations
Week 8	. Electromagnetic waves and wave equation in a medium having finite permeability and permittvity but with conductivity $\sigma=0$.
Week 9	Pointing vector. Impedance of a dielectric to EM waves, EM waves in a conducting medium and skin depth.
Week 10	EM waves velocity in a conductor an anomalous dispersion.
Week 11	Response of a conducting medium of EM waves
Week 12	Reflection and transmission of EM waves at a boundary of two dielectric media for normal incidence
Week 13	Reflection of EM waves from the surface of a conductor at normal incidence

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SESSION 2019-2020

B.Sc.1 (Sem II)

Subject: ElectricityAnd Magnetism-II

Tentative lesson plan from Feb 2020 to May 2020

Two weeks left for MST tentative and one week for revision/queries for MST.

TIME PERIOD	TOPICS TO BE COVERED
Week 1	Behavior of various substances in magnetic field. Definition of **M** and **H** and their relation to free and bound currents
Week 2	Permeability and susceptibilities and their inter-relationship. Orbital motion of electrons and diamagnetism.
Week 3	Electron spin and paramagnetism. Ferromagnetism. Domain theory of Ferromagnetism.
Week 4	Hysteresis Loss. Magnetization curve Ferrites. Lorentz's force
Week 5	Definition of B, Biot Savart's Law and its applications to long straight wire
Week 6	Circular current loop and solenoid. Ampere's Circuital law and its applications.
Week 7	Divergence and curl of **B**. Hall effect, expression and co-efficient. Vector potential,
Week 8	Definition and derivation of current density and its use in calculation of change in magnetic field at a current sheet.
Week 9	Transformation equations for **E** and **B** from one frame to another
Week 10	Faraday's Law and EM induction. Displacement current.
Week 11	Maxwell's equations. Mutual inductance and reciprocity theorem
Week 12	Self inductance L for solenoid. Coupling of Electrical circuits
Week 13	Analysis of LCR series and parallel resonant circuits. Q-factor. Power consumed Power factor.

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