

**LESSON PLAN FOR EVEN SEMESTER(01 Feb. 2023- 05 May 2023)**

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**Designation : Assistant Professor**

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Week	Date	THEORY (06 PERIODS/WEEK)		THEORY (04 PERIODS/WEEK)		
		M. Sc.– II(4 <sup>th</sup> Sem) Paper (Mon.,Wed.,thu and sat) Applied nuclear techniques [04 PERIODS/WEEK ]	M. Sc. – II(4 <sup>th</sup> Sem) Paper (Thu, FRI Fiber optics [02 PERIODS/WEEK]	M.Sc.-II Sem. (Wed,Thu,fri) Condensed matter physics [03 PER./WEEK]	M.Sc.-4 <sup>th</sup> Sem. Practical (1 Lectures) (TUE)	M.Sc.-II Sem. Practical (Mon)
1	01.02.2023	<b>UNIT-I</b> Basic principle, working and applications of Van-de-Graff	-----	<b>UNIT-I</b> Lattice Dynamics : Lattice vibrations of 3D solids	-----	-----
	02.02.2023	Tandom accelerator	-----	Quantization of lattice vibrations	-----	-----
	03.02.2023	-----	<b>UNIT-I</b> Optical Fibres : Importance	Diffraction of X-rays, electrons and neutrons by a vibrating lattice	-----	-----
	04.02.2023	Pelletron Accelerators	-----	-----	-----	-----
	05.02.2023	Sunday				
	06.02.2023	Pelletron Accelerators	-----	-----	-----	As per remarks
	07.02.2023	-----	An Idea about generations of Telephone	-----	As per remarks	

2			System and Optical fibres			
	08.02.2023	Cyclotron, Focussing in Cyclotrons	-----	Debye-Waller factor, Anharmonicity and thermal expansion	-----	-----
	09.02.2023	Relativistic limitation	-----	Electronic Energy Bands	-----	-----
	10.02.2023	-----	An Idea about generations of Telephone System and Optical fibres	Bloch's theorem, Tight-binding method	-----	-----
	11.02.2023	Variable energy cyclotron	-----	-----	-----	-----
	12.02.2023	Sunday				
3	13.02.2023	, Microtron	-----	-----	-----	As per remarks
	14.02.2023	-----	Propagation of light in optical fibres	-----	As per remarks	
	15.02.2023	Betatron acceleration machine	-----	Orthogonalized plane wave method		-----
	16.02.2023	Electron synchrotron	-----	Pseudopotential method, Conduction electrons in uniform external magnetic fields and Cyclotron resonance		-----
	17.02.2023	-----	Basic structure and optical path of an optical fibre	de Haas-van Alphen effect.	-----	-----
	18.02.2023	Mahashivratri				

4	19.02.2023	Sunday				
	20.02.2023	Proton synchrotron	-----	-----		As per remarks
	21.02.2023	-----	Acceptance angle and acceptance cone	-----	As per remarks	
	22.02.2023	Medical application of accelerators	-----	de Haas-van Alphen effect.		-----
	23.02.2023	Medical application of accelerators	-----	de Haas-van Alphen effect.		-----
	24.02.2023	-----	Acceptance angle and acceptance cone	Revision		
	25.02.2023		-----	-----	-----	-----
	26.02.2023	Sunday				
	27.02.2023	Mega volt therapy	-----	-----		As per remarks
	28.02.2023	National Science Day Celebration				
	01.03.2023	<b>UNIT – II</b> Charged Particle Induced X-ray Emission (PIXE) spectrometry	-----	<b>UNIT – II</b> surfaces and Interface		
	02.03.2023	Basic Principle, X-ray production process	-----	Work function and contact potential		-----

	03.03.2023	-----	Numerical aperture (General	Thermoionic emission, Superlattices	-----	-----
	04.03.2023	Radiative and Non-radiative transitions	-----	-----		
	05.03.2023 to 12.03.2023	Holy Vacations				
	13.03.2023	Coster Krönig transitions	-----	-----	-----	As per remarks
	14.03.2023	-----	Modes of propagation	-----	As per remarks	
	15.03.2023	continuous background	-----	Quantum wells		-----
	16.03.2023	Brennsstrahlung, PIXE set-up	-----	Quantum wires		-----
	17.03.2023	-----	meridional and skew rays, number of modes and cut off parameters of fibres,	Quantum dots and Carbon nanotubes	-----	-----
	18.03.2023	Instrumentation	-----	-----	-----	-----
	19.03.2023	Sunday				
	20.03.2023	Beam preparation	-----	-----		As per remarks
	21.03.2023	-----	Single mode propagation, Comparison of step and graded index fibres	-----	As per remarks	

6	22.03.2023	collimation, Beam current measurement	-----	Correlation and Response : Dynamic correlation and linear response functions		-----
	23.03.2023	Sahidi Diwas				
	24.03.2023	-----	<b>UNIT – II</b> Classification of optical fibres	Undamped and damped oscillators	-----	-----
	25.03.2023	Qualitative analysis: Energy calibration	-----	-----	-----	-----
	26.03.2023	Sunday				
7	27.03.2023	Quantitative analysis : Absolute method	-----	-----	-----	As per remarks
	28.03.2023	-----	Fibres : Stepped-index fibre, stepped - index Monomode fibre	-----	As per remarks	
	29.03.2023	Relative method, Relationship between X-ray intensities and concentrations	-----	Diffusion, Brownian motion and Langevin theory		-----
	30.03.2023	Ram Naomi				
	31.03.2023	-----	Disadvantage of monomode fibre	Electron Gas in Metals : Hartree-Fock theory	-----	-----

01.04.2023	Limits of detection	-----	-----	-----	-----
02.04.2023	Sunday				
03.04.2023	Accuracy of analysis	-----	-----		As per remarks
04.04.2023	Mahavir Jayanti				
05.04.2023	Application of PIXE in air and water pollution industry	-----	exchange charge density and Fermi hole in a free-electron gas, Dielectric screening		-----
06.04.2023	Archaeology, Biology	-----	ThomasFermi theory, Lindhard theory	.	-----
07.04.2023	-----	graded index multi mode fibre	Random phase approximation	-----	-----
08.04.2023	Earth Science, External beam PIXE	-----		-----	-----
09.04.2023	Sunday				
10.04.2023	Micro beam PIXE, Proton Microprobe	-----	-----	-----	As per remarks
11.04.2023	-----	Fibre Fabrication Techniques	-----	As per remarks	
12.04.2023	Micro beam applications	-----	<b>UNIT – III</b> coupled wells and superlattices		-----

9	13.04.2023	Micro beam applications	-----	Transport in nanostructures : Tunneling in planar barrier structures		
	14.04.2023	Dr. B. R. Ambedkar Jayanti				
	15.04.2023	<b>UNIT – III</b> X-rays fluorescence spectrometry : Nature and origin of X-rays	-----	-----	-----	-----
	16.04.2023	Sunday				
10	17.04.2023	characteristic X-ray, notation for spectrum, Continuous spectra	-----	-----	-----	As per remarks
	18.04.2023	-----	Outside vapour phase oxidation	-----	As per remarks	
	19.04.2023	Duane - Hunt Law, Relationship between X-ray emission and atomic number	-----	single and double barrier cases		-----
	20.04.2023	Sources of X-rays : X-ray tube	-----	quantized conductance in nanostructures		-----
	21.04.2023	-----	vapour phase axial deposition	transport in quantum wave guide structures	-----	-----

	22.04.2023	Function and requirements, Radioisotope source	-----	-----	-----	
	23.04.2023	Sunday				
11	24.04.2023	XRF spectrometer, wave length dispersive devices	-----	-----	-----	As per remarks
	25.04.2023	-----	, modified chemical vapour deposition	-----	As per remarks	
	26.04.2023	Energy dispersive devices, pulse height selection	-----	<b>UNIT – IV</b> Electronic devices : Velocity - modulation and quantum interference transistors		-----
	27.04.2023	Data analysis identification of the peaks, equation for concentration of elements,	-----	ballistic - injection devices		-----
	28.04.2023	-----	,modified chemical vapour deposition	resonant - tunneling devices	-----	-----



	29.04.2023	Matrix effects, Absorption - enhancement effect	-----	-----	-	-----
	30.04.2023	Sunday				
12	01.05.2023	Detection limits.	-----	-----	-----	As per remarks
	02.05.2023	-----	Fibre cable construction, Strength member, Cable tensile loading, Minimum bend radius	-----	As per remarks	
	03.05.2023	Application of XRF in various fields, Advantages and disadvantage of XRF.	-----	Optical devices : Quantum - well lasers		-----
	04.05.2023	<b>UNIT – IV</b> Classification of neutron activation methods &. Experimental considerations in activation methods	-----	surface-emitting lasers, quantum - wire lasers		-----
	05.05.2023	-----	Losses incurred during installation of cables or during subscriber service and cable selection criteria.	blue quantum-well lasers, quantum - cascade lasers, multiple-quantum- well photodetectors	-----	-----
	06.05.2023	Applications NAA	-----	-----	-----	-----

	07.05.2023	
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Sunday

### **PRACTICAL LIST- II SEMESTER**

- 1 Study clipping and clamping circuit
- 2 calculation of hall coefficient using hall effect apparatus.
- 3 study field effect transistor: J-FET and MOS-FET.
- 4 Study of modulation and demodulation.
- 5 study curie temperature.
- 6 To study thermoluminescence
- 7 To study young modulus of material.
- 8 study of Boolean expression using logic gates.

### **PRACTICAL LIST- IV SEMESTER**

- 1 study of simpson  $1/3^{\text{rd}}$  rule using FORTRAN programming.
- 2 study of simpson  $3/8^{\text{th}}$  rule using FORTRAN programming
- 3 study of newton raphson method using FORTRAN programming
- 4 study of bisection method using FORTRAN programming
- 5 study of curve fitting using FORTRAN programming
- 6 study of gauss elimination using FORTRAN programming
- 7 study of eigen value of matrices using FORTRAN programming
- 8 study of trapezoidal method using FORTRAN programming