

## Lesson Plan

Name of the Assistant/ Associate Professor: - Dr. Vinod Kumar

Class and Section: M.Sc. Physics (Semester IV)

Subject: Material Science-II

Paper code: PHY 404C

Week	Date	Topics
1	1-Jan-18	The Tension Test: engineering stress-strain curve.
	2-Jan-18	True stress-strain curve, instability in tension, Considere's construction
	3-Jan-18	Ductility measurement, effect of strain rate on flow properties, strain rate sensitivity.
	4-Jan-18	Tensile test; The Hardness Test: Brinell hardness, Meyer hardness, Vicker's hardness number.
	5-Jan-18	Notch test, Rockwell hardness test, Knoop hardness number and test;
	6-Jan-18	The Impact Test: brittle fracture problem, notched bar impact tests-Carpy and Izod Impact tests;
	7-Jan-18	Sunday
2	8-Jan-18	The Fatigue Test: fatigue failures, stress cycles.
	9-Jan-18	do
	10-Jan-18	The S-N curve, fatigue limit.
	11-Jan-18	do
	12-Jan-18	The Creep Test: creep curve, primary.
	13-Jan-18	do
	14-Jan-18	Sunday
3	15-Jan-18	Secondary and Tertiary creep.
	16-Jan-18	do
	17-Jan-18	do
	18-Jan-18	Effect of temperature and stress on the creep curve.
	19-Jan-18	Problem on above topics
	20-Jan-18	test
	21-Jan-18	Sunday
4	22-Jan-18	Vasant Panchami
	23-Jan-18	Tutorial on various topics
	24-Jan-18	Sir Chhotu Ram Jayanti
	25-Jan-18	do
	26-Jan-18	Republic Day
	27-Jan-18	do
	28-Jan-18	Sunday
5	29-Jan-18	Problem on above topics
	30-Jan-18	Assignment
	31-Jan-18	test

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1	1-Feb-18	Magnetic Processes: Larmor frequency.
	2-Feb-18	Diamagnetism, magnetic susceptibility
	3-Feb-18	do
	4-Feb-18	Sunday
2	5-Feb-18	Langevin's diamagnetism equation
	6-Feb-18	Paramagnetism
	7-Feb-18	Curie constant
	8-Feb-18	Density of states curves for a metal
	9-Feb-18	do
	10-Feb-18	Maharshi Dayanand Saraswati Jayanti
	11-Feb-18	Sunday
3	12-Feb-18	Ferromagnetism, Curie temperature
	13-Feb-18	Maha Shivratri
	14-Feb-18	do
	15-Feb-18	Curie-Weiss law, exchange interactions.
	16-Feb-18	do
	17-Feb-18	Problem on above topics
	18-Feb-18	Sunday
4	19-Feb-18	domain structure; Antiferromagnetism and magnetic susceptibility of an antiferromagnetic material
	20-Feb-18	do
	21-Feb-18	do
	22-Feb-18	Ferrimagnetism and Ferrites; Paramagnetic, ferromagnetic resonance.
	23-Feb-18	do
	24-Feb-18	do
	25-Feb-18	Sunday
5	26-Feb-18	Cyclotron-resonance
	27-Feb-18	Assignment
	28-Feb-18	As per Uni. Calendar Holiday

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Week	Date	Topics
1	1-Mar-18	Guru Ravidas Birthday
	2-Mar-18	Holi
	3-Mar-18	As per Uni. Calendar Holiday
	4-Mar-18	Sunday
2	5-Mar-18	Introduction, Energy bands, dielectric constant, complex permittivity, dielectric loss factor, polarization.
	6-Mar-18	do
	7-Mar-18	do
	8-Mar-18	Mechanism of polarization, classification of dielectrics-frequency dependence of dielectric constant
	9-Mar-18	do
	10-Mar-18	do
	11-Mar-18	Sunday
3	12-Mar-18	Optical absorption, transmission and reflection, refractive index.
	13-Mar-18	do
	14-Mar-18	do
	15-Mar-18	Color; Ferro, para and pyro-electric states, transition temperature.
	16-Mar-18	do
	17-Mar-18	do
	18-Mar-18	Sunday
4	19-Mar-18	Classification of ferro electric crystals, polarization catastrophe
	20-Mar-18	do
	21-Mar-18	do
	22-Mar-18	Landau theory of first and second-order phase transitions.
	23-Mar-18	do
	24-Mar-18	do
	25-Mar-18	Sunday/ Ram Navami
5	26-Mar-18	Antiferroelectricity, ferro electric domains.
	27-Mar-18	Tutorial on various topic
	28-Mar-18	do
	29-Mar-18	Mahavir Jayanti
	30-Mar-18	Unit Test
	31-Mar-18	Assignment

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Week	Date	Topics
1	1-Apr-18	Sunday
	2-Apr-18	Surface and its importance, selvedge depths of surface.
	3-Apr-18	do
	4-Apr-18	Methods of Surface Analysis: Auger Electron spectroscopy (AES)- basic principle, methodology, composition analysis and depth profiling.
	5-Apr-18	do
	6-Apr-18	do
	7-Apr-18	do
	8-Apr-18	Sunday
2	9-Apr-18	X-ray photoelectron spectroscopy (XPS) or ESCA: principle, methodology and quantitative analysis.
	10-Apr-18	do
	11-Apr-18	do
	12-Apr-18	do
	13-Apr-18	Glancing angle X-ray Diffraction (GXR), basic concept, methodology and structural analysis.
	14-Apr-18	Dr Ambedkar Jayanti / Vaisakhi
	15-Apr-18	Sunday
3	16-Apr-18	do
	17-Apr-18	do
	18-Apr-18	Parashurama Jayanti
	19-Apr-18	Scanning Electron Microscopy (SEM) and Transmission Electron Microscopy (TEM): Principle, methodology and Applications in surface analysis.
	20-Apr-18	do
	21-Apr-18	do
	22-Apr-18	Sunday
4	23-Apr-18	Atomic Force Microscopy (AFM): Basic principle, Methodology, applications in structural analysis.
	24-Apr-18	do
	25-Apr-18	Tutorial on various Topic
	26-Apr-18	do
	27-Apr-18	Unit Test
	28-Apr-18	Assignment