

Lesson Plan Format
18 weeks (From January 2018 to April 2018)

Name of Assistant /Associate Professor : Dr. Jitender Singh Ph.D.
 Class and Section : B.Sc. - III Computer Science
 Subject : Nuclear, Atomic, Molecular, Laser Physics

Week 1(January 1-6)	
Chapter 1	
01/01/2018	Introduction to nuclear Physics
02/01/2018	Nuclear structure and its properties.
03/01/2018	Determination of mass by Bain Bridge.
04/01/2018	Introduction to various atomic models and drawback
05/01/2018	of Bohr Model. Main features of Vector Atom
06/01/2017	Model, Origin of fine spectra
Week 2(January 8-13)	
Chapter	
08/01/2018	Jordan mass spectrograph
09/01/2018	Determination of charge by Mosley law
10/01/2018	Determination of size of nuclei by Rutherford back scattering.
11/01/2018	Quantum numbers associated with vector atom model
12/01/2018	Penetrating and non penetrating orbits
13/01/2018	Alkali spectra and why principal series is absorption series.
Week 3(January 15-20)	
Chapter	
15/01/2018	Integration of heavy charged particles
16/01/2018	Alpha - disintegration theory
17/01/2018	Energy loss of heavy charged particles.
18/01/2018	Spin - Orbit interaction energy and more than
19/01/2018	Doublet term separation of terms } 2 lectures.
19/01/2018	
20/01/2018	Holiday
Week 4(January 22-27)	
Chapter	
22/01/2018	Holiday
23/01/2018	Energetics of alpha decay
24/01/2018	Range and straggling of alpha particles
25/01/2018	Coupling Schemes, ll, ss, jj, LS
26/01/2018	Holiday

27/01/2018	
Week 5 (January 29- Feb 3)	
Chapter	
29/01/2018	Geigner Nuttal law, Neutrons hypothesis
30/01/2018	Energy loss of heavy charged particles beta decay
31/01/2018	Energy loss of β - particles
01/02/2018	Vector diagrams of coupling schemes
02/02/2018	Interaction energy LS coupling
03/02/2018	-dd - jj coupling
Week 6 (Feb 5-10)	
Chapter	
05/02/2018	Range of electrons
06/02/2018	Absorption of beta particles
07/02/2018	Nature of γ -rays
08/02/2018	Zeeman effect (Classical and Quantum concept)
09/02/2018	Normal Zeeman effect, its derivation, transition table
10/02/2018	Holiday
Week 7 (Feb 12-17)	
Chapter	
12/02/2017	Energetics of gamma rays
13/02/2017	Holiday
14/02/2017	Passage of γ -radiations through matter
15/02/2017	Anomalous Zeeman effect, derivation, } 2 lectures
16/02/2017	vector diagram, Ex of Na
17/02/2017	Paschen Back effect.
Week 8 (Feb 19-24)	
Chapter	
19/02/2018	Photoelectric, Compton, pair production effect.
20/02/2018	Electron-Positron annihilation
21/02/2018	Absorption of γ -rays and its applications.
22/02/2018	Stark effect (different components)
23/02/2018	Weak field Stark effect in Hydrogen
24/02/2018	Main Features of LASER
Week 9 (Feb 26-March 03)	
Chapter	
26/02/2018	Introduction to nuclear reactions.
27/02/2018	Elastic scattering, Inelastic scattering
28/02/2018	Nuclear disintegration, Photoneuclear reactions.
01/03/2018	Holiday

02/03/2018	Properties of Laser - Directionality, Intensity
03/03/2018	Monochromaticity, Spatial and temporal Coherence.
Week 10(March 5-10)	
Chapter	
05/03/2018	Radioactive capture, Direct reactions, Heavy ion reactions.
06/03/2018	Spallation reactions, Conservation laws,
07/03/2018	Q - value, Reaction Threshold.
08/03/2018	Einstein coefficients, probability of stimulated emission and absorption.
09/03/2018	Possibility of amplification, Momentum transfer
10/03/2018	Life time of a level and Monostable state
Week 11(March 12-17)	
Chapter	
12/03/2018	Nuclear Reactors
13/03/2018	General aspects of Reactor design,
14/03/2018	Nuclear fusion and fission reactors.
15/03/2018	Kinematic of Optical absorption, Threshold condition for
16/03/2018	Laser emission, Line shape function, Line shape and width
17/03/2018	Fuchbauer Ladenberg Formula
Week 12(March 19-24)	
Chapter	
19/03/2018	Linear Accelerators
20/03/2018	Tandem Accelerators
21/03/2018	Cyclotron Accelerators.
22/03/2018	Laser Pumping, Quantum yield ϕ
23/03/2018	Holiday
24/03/2018	Gas Lasers, Energy levels of Ruby laser
Week 13(March 26-31)	
Chapter	
26/03/2018	Betatron Accelerators.
27/03/2018	Nuclear Detectors.
28/03/2018	Ionisation Chamber Detector
29/03/2018	Holiday
30/03/2018	Pumping Inversion, Construction of Ruby Laser
31/03/2018	He Ne Laser, Principle, construction working
Week 14(April 02-07)	
Chapter	
02/04/2018	Proportional Counter Detectors
03/04/2018	G.M. Counter detectors
04/04/2018	Scintillation Counters.

