

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

Name of Assistant /Associate Professor : Dr. Harinder Singh Dahiya  
 Class and Section : ...B.Sc. III... Hon. Med.  
 Subject : Nuclear, Atomic, Molecular, Laser Ph

<b>Week 1(January 1-6)</b>	
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
<b>Week 2(January 8-13)</b>	
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 atoms on
12/01/2018	penetrating and non penetrating orbits
13/01/2018	Alkali spectra and why principal series is absorption series
<b>Week 3(January 15-20)</b>	
Chapter	
15/01/2018	Interaction 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
<b>Week 4(January 22-27)</b>	
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	
<b>Week 5 (January 29- Feb 3)</b>	
<b>Chapter</b>	
29/01/2018	Greignor Nuttal law, Neutrene hypothesis
30/01/2018	Energy loss of heavy charged particles beta decay
31/01/2018	Energy loss of $\beta$ - particles
01/02/2018	Vector diagrams of coupling schemes
02/02/2018	Interaction energy LS coupling
03/02/2018	- do - JJ coupling
<b>Week 6 (Feb 5-10)</b>	
<b>Chapter</b>	
05/02/2018	Range of electrons
06/02/2018	Absorption of beta particles.
07/02/2018	Nature of $\gamma$ rays.
08/02/2018	Zeeaman effect (Classical and Quantum concept)
09/02/2018	Normal Zeeaman effect, its derivation, transition table
10/02/2018	Holiday
<b>Week 7 (Feb 12-17)</b>	
<b>Chapter</b>	
12/02/2017	Energetics of gamma rays
13/02/2017	Holiday
14/02/2017	Passage of $\gamma$ - radiations through matter
15/02/2017	Anomalous Zeeaman effect, derivation, } 2 lectures
16/02/2017	vector diagram, Ex of Na
17/02/2017	Paschen Back effect.
<b>Week 8 (Feb 19-24)</b>	
<b>Chapter</b>	
19/02/2018	Photoelectric, Compton, pair production effect
20/02/2018	Electron-Positron annihilation
21/02/2018	Absorption of $\gamma$ - 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
<b>Week 9 (Feb 26-March 03)</b>	
<b>Chapter</b>	
26/02/2018	Introduction to nuclear reactions.
27/02/2018	Elastic scattering, Inelastic scattering
28/02/2018	Nuclear disintegration, Photonuclear reactions.
01/03/2018	Holiday

02/03/2018	Properties of Laser - Directionality, Intensity
03/03/2018	Monochromaticity, Spatial and temporal Coherence.
<b>Week 10(March 5-10)</b>	
<b>Chapter</b>	
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 metastable state
<b>Week 11(March 12-17)</b>	
<b>Chapter</b>	
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	Fuchsbauer Ladenburg formula
<b>Week 12(March 19-24)</b>	
<b>Chapter</b>	
19/03/2018	Linear Accelerators
20/03/2018	Tandem Accelerators
21/03/2018	Cyclotron Accelerators.
22/03/2018	Laser Pumping, Quantum yield of
23/03/2018	Holiday
24/03/2018	Gas Lasers, Energy levels of Ruby laser
<b>Week 13(March 26-31)</b>	
<b>Chapter</b>	
26/03/2018	Betatron Accelerators.
27/03/2018	Nuclear Detectors.
28/03/2018	Ionisation Chamber Detector
29/03/2018	Holiday
30/03/2018	Pumping Transition, Construction of Ruby Laser
31/03/2018	He Ne Laser, Principle, construction working
<b>Week 14(April 02-07)</b>	
<b>Chapter</b>	
02/04/2018	Proportional Counter Detectors
03/04/2018	G. M. Counter detectors
04/04/2018	Scintillation Counters

