

## Lesson Plan

Name of the Assistant/ Associate Professor: - Dr. Manjeet Singh

Class and Section: M.Sc. Physics 2<sup>nd</sup> Sem.

Subject: Nuclear and Particle Physics

Paper code: PHY-202

Week	Date	Topics
1	1-Jan-18	<b>Unit I: Interaction of Radiation with Matter:</b> Interaction of Charged Particles with Matter
	2-Jan-18	qualitative description of various energy loss mechanisms
	3-Jan-18	qualitative description of various energy loss mechanisms (Continue)
	4-Jan-18	their relative contribution in case of heavy ions and electrons
	5-Jan-18	their relative contribution in case of heavy ions and electrons (Continue)
	6-Jan-18	classical stopping power equation for electronic energy-loss (no derivation) with significance of various terms involved
	7-Jan-18	Sunday
2	8-Jan-18	Behavior of electronic energy-loss curve as a function of ion velocity
	9-Jan-18	Behavior of electronic energy-loss curve as a function of ion velocity (Continue)
	10-Jan-18	concept of energy straggling and their correlation
	11-Jan-18	concept of range straggling and their correlation
	12-Jan-18	Interaction of Gamma Radiation with Matter:
	13-Jan-18	Features of photoelectric process
	14-Jan-18	Sunday
3	15-Jan-18	Features of Compton scattering
	16-Jan-18	Features of pair production processes
	17-Jan-18	interaction cross sections
	18-Jan-18	energy, target and projectile dependence of all three processes
	19-Jan-18	linear and mass attenuation coefficients of gamma rays in matter, positron annihilation in matter
	20-Jan-18	linear and mass attenuation coefficients of gamma rays in matter, positron annihilation in matter (Continue)
	21-Jan-18	Sunday
4	22-Jan-18	Vasant Panchami
	23-Jan-18	Assignment
	24-Jan-18	Sir Chhotu Ram Jayanti
	25-Jan-18	Problem on above topics
	26-Jan-18	Republic Day
	27-Jan-18	Class Test for 1 <sup>st</sup> unit
	28-Jan-18	Sunday
5	29-Jan-18	<b>Unit II: Radiation Detectors:</b> Introduction to G.M. Counter
	30-Jan-18	G.M. Counter: basic principle, construction and working
	31-Jan-18	Geiger discharge

## Lesson Plan

Name of the Assistant/ Associate Professor: - Dr. Manjeet Singh

Class and Section: M.Sc. Physics 2<sup>nd</sup> Sem.

Subject: Nuclear and Particle Physics

Paper code: PHY-202

Week	Date	Topics
1	1-Feb-18	quenching
	2-Feb-18	mechanism of pulse formation
	3-Feb-18	Gamma Ray Spectrometer
	4-Feb-18	Sunday
2	5-Feb-18	Gamma Ray Spectrometer: basic principle and working of NaI (Tl) scintillation detector
	6-Feb-18	Gamma Ray Spectrometer: basic principle and working of NaI (Tl) scintillation detector
	7-Feb-18	mechanism of pulse formation
	8-Feb-18	mechanism of pulse formation (Continue)
	9-Feb-18	basic idea of pulse processing unit
	10-Feb-18	Maharshi Dayanand Saraswati Jayanti
	11-Feb-18	Sunday
3	12-Feb-18	basic idea of pulse processing unit (Continue)
	13-Feb-18	Maha Shivratri
	14-Feb-18	concept of energy resolution
	15-Feb-18	efficiency of detector and its applications
	16-Feb-18	Semiconductor Detectors
	17-Feb-18	Semiconductor Detectors: basic principle, construction
	18-Feb-18	Sunday
4	19-Feb-18	Semiconductor Detectors: working of Si surface barrier
	20-Feb-18	Semiconductor Detectors: importance and applications of Si surface barrier
	21-Feb-18	lithium drifted silicon detectors
	22-Feb-18	lithium drifted germanium detectors
	23-Feb-18	high purity germanium detector
	24-Feb-18	Assignment
	25-Feb-18	Sunday
5	26-Feb-18	Problem on above topics
	27-Feb-18	Class Test for 2 <sup>nd</sup> unit
	28-Feb-18	As per Uni. Calendar Holiday

## Lesson Plan

Name of the Assistant/ Associate Professor: - Dr. Manjeet Singh

Class and Section: M.Sc. Physics 2<sup>nd</sup> Sem.

Subject: Nuclear and Particle Physics

Paper code: PHY-202

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	<b>Unit III: Radioactive Decays, Nuclear Forces and Nuclear Reactions: Radioactive Decays</b>
	6-Mar-18	Energetics of alpha decay
	7-Mar-18	Tunnel theory of alpha decay
	8-Mar-18	Tunnel theory of alpha decay (Continue)
	9-Mar-18	Mechanism of beta decay
	10-Mar-18	Energetics of beta decay
	11-Mar-18	Sunday
3	12-Mar-18	Fermi theory of allowed beta decay
	13-Mar-18	Importance of Fermi-Kurie plot,
	14-Mar-18	parity non-conserving property of neutrino
	15-Mar-18	Nuclear Forces: experimental evidence of charge symmetry of nuclear forces
	16-Mar-18	Nuclear Forces: experimental evidence of charge independence of nuclear forces
	17-Mar-18	concept of isospin
	18-Mar-18	Sunday
4	19-Mar-18	Meson theory of nuclear forces
	20-Mar-18	relationship between the range of the force and mass of the mediating particle
	21-Mar-18	Nuclear Reactions: types of nuclear reactions
	22-Mar-18	Q-value of a nuclear reaction and its Determination
	23-Mar-18	Shaheedi Diwas of Bhagat Singh, Rajguru & Sukhdev
	24-Mar-18	definition of cross section and its significance
	25-Mar-18	Sunday/ Ram Navami
5	26-Mar-18	elementary idea of compound nuclear reactions and direct reactions
	27-Mar-18	concept of neutron reactions Coulomb excitation
	28-Mar-18	Assignment
	29-Mar-18	Mahavir Jayanti
	30-Mar-18	Problem on above topics
	31-Mar-18	Class Test for 3 <sup>rd</sup> unit

## Lesson Plan

Name of the Assistant/ Associate Professor: - Dr. Manjeet Singh

Class and Section: M.Sc. Physics 2<sup>nd</sup> Sem.

Subject: Nuclear and Particle Physics

Paper code: PHY-202

Week	Date	Topics
1	1-Apr-18	Sunday
	2-Apr-18	<b>Unit IV: Particle Physics:</b> Units in high energy physics
	3-Apr-18	Classification of particles- fermions and bosons
	4-Apr-18	particles and antiparticles
	5-Apr-18	Strange particles
	6-Apr-18	Basic idea of different fundamental types of interactions with suitable examples
	7-Apr-18	Basic idea of different fundamental types of interactions with suitable examples (Continue)
	8-Apr-18	Sunday
2	9-Apr-18	Quark flavors and their quantum numbers
	10-Apr-18	Quark flavors and their quantum numbers (Continue)
	11-Apr-18	Quarks as constituents of Hadrons
	12-Apr-18	Quarks as constituents of Hadrons (Continue)
	13-Apr-18	Qualitative idea of Quark confinement and asymptotic freedom
	14-Apr-18	Dr AmbedkarJayanti / Vaisakhi
	15-Apr-18	Sunday
3	16-Apr-18	necessity of introducing colour quantum number
	17-Apr-18	Classification of elementary particles
	18-Apr-18	ParashuramaJayanti
	19-Apr-18	Lepton family
	20-Apr-18	Baryon family
	21-Apr-18	Gell-Mann Nisijima formula
	22-Apr-18	Sunday
4	23-Apr-18	Nuclear reactions between elementary particles
	24-Apr-18	Assignment
	25-Apr-18	Problem on above topics
	26-Apr-18	Class Test for 4 <sup>th</sup> unit
	27-Apr-18	Sessional test for: 1 <sup>st</sup> and 2 <sup>nd</sup> unit
	28-Apr-18	Sessional test for: 3 <sup>rd</sup> and 4 <sup>th</sup> unit