RPS DEGREE COLLEGE
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Lesson plan

Name of the Assistant/ Associate Professor: **Dr. Jitendra Gangwar**
Class and Section: **M. Sc. Physics, Semester I**
Subject: **Mathematical Physics** Paper Code: **PHY (H) - 101**

Day No.	Topics	Remarks
Day 1	**Unit I: Vector Calculus and Matrices**	
Day 2	Definition of a linear vector space	
Day 3	Linear independence	
Day 4	Based Numericals	
Day 5	Basis and dimension	
Day 6	Based Numericals	
Day 7	Scalar product	
Day 8	Based numerical	
Day 9	--continue--	
Day 10	Orthonormal basis and related numerical	
Day 11	--continue--	
Day 12	Gram-Schmidt Orthogonalization process	
Day 13	Related numerical	
Day 14	Linear operators	
Day 15	Matrices	
Day 16	--continue--	
Day 17	Orthogonal and Unitary Matrices	
Day 18	Hermitian matrix	
Day 19	--continue--	
Day 20	Eigenvalues and eigenvectors of matrices	
Day 21	--continue--	
Day 22	Matrix Daigonalization	
Day 23	Related Numericals	
Day 24	Matrix Daigonalization related numerical	
Day 25	**Class Test: 01**	
Day 26	Matrix Daigonalization related numerical	
Day 27	**Unit II: Differential equations (DE)**	
Day 28	2^{nd} order linear DE with variable coefficients	
Day 29	ordinary point, singular point	
Day 30	**First Assignment**	
Day 31	series solution around an ordinary point	
Day 32	--continue--	
Day 33	series solution around a regular singular point	
Day 34	--continue--	
Day 35	the method of Frobenius and Wronskian	
Day 36	getting a second solution	
Day 37	--continue--	
Day 38	Solution of Legendre's equation	
Day 39	--continue--	
Day 40	--continue--	

Day 41	Solution of Bessel's equation	
Day 42	Solution of Laguarre's equation	
Day 43	Solution of Hermite's equation	
Day 44	--continue--	
Day 45	**Unit III: Special Functions**	
Day 46	Definition of special functions	
Day 47	Generating functions for Bessel function of integral order $J_n(x)$	
Day 48	**Class Test: 02**	
Day 49	Recurrence relations	
Day 50	--continue--	
Day 51	Integral representation	
Day 52	Legendre polynomials $P_n(x)$	
Day 53	**Second Assignment**	
Day 54	Generating functions for $P_n(x)$	
Day 55	--continue--	
Day 56	Recurrence relations for $P_n(x)$	
Day 57	Hermite Polynomials, Generating functions	
Day 58	Rodrigue's formula for Hermite polynomials	
Day 59	Laguerre polynomials, Generating function	
Day 60	--continue--	
Day 61	Recurrence relations for $L_n(x)$	
Day 62	**Unit IV: Integral Transforms**	
Day 63	Integral transform, Laplace transform	
Day 64	some simple properties of Laplace transforms	
Day 65	first and second shifting property	
Day 66	Inverse Laplace Transform by partial fractions method	
Day 67	Laplace transform of derivatives	
Day 68	**Class Test: 03**	
Day 69	Laplace transform of derivatives	
Day 70	Evaluation of coefficients of Fourier Cosine series	
Day 71	Evaluation of coefficients of Fourier Sine series	
Day 72	--continue--	
Day 73	**Third Assignment**	
Day 74	Fourier Transforms, Fourier sine Transforms	
Day 75	Fourier cosine Transforms and Complex Analysis	
Day 76	--continue--	
Day 77	Solution of Question Paper: 2014-15	
Day 78	Solution of Question Paper: 2015-16	
Day 79	Solution of Question Paper: 2016-17	
Day 80	Solution of Question Paper: 2017-18	
Day 81	Solution of Question Paper: 2018-19	

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Lesson Plan

M. Sc. Physics (Semester: I)
Paper II
Classical Mechanics (PHY (H) - 102)
Teacher`s name: Ms.Poonam Yadav

Day No.	Particular	Remarks
Day 1	**Unit I: Survey of Elementary Principles(Introduction)**	
Day 2	Newtonian mechanics of one particle systems	
Day 3	Newtonian mechanics of many particle systems	
Day 4	--Continue--	
Day 5	Conservation laws	
Day 6	Constraints and their classification	
Day 7	--Continue--	
Day 8	--Continue--	
Day 9	D' Alembert's principle	
Day 10	--Continue--	
Day 11	Lagrange's equations	
Day 12	**Unit I: Lagragian Formulation**	
Day 13	--Continue--	
Day 14	Dissipative forces, generalized coordinates	
Day 15	generalized momenta	

Day 16	integrals of motion	
Day 17	symmetries of space and time	
Day 18	--continue--	
Day 19	their connection with conservation laws	
Day 20	--continue--	
Day 21	invariance under Galilian transformation	
Day 22	--continue--	
Day 23	Lagragian Formulation for various systems	
Day 24	**Unit II: Moving coordinate systems**	
Day 25	Rotating frames; intertial forces	
Day 26	--continue--	
Day 27	**Class Test: 01**	
Day 28	terrestrial applications of coriolis force	
Day 29	**First Assignment**	
Day 30	terrestrial applications of coriolis force	
Day 31	Central force: definition and characteristics	
Day 32	--continue--	
Day 33	two body problem	
Day 34	--continue--	
Day 35	closure and stability of circular orbits	
Day 36	--continue--	

Day 37	general analysis of orbits	
Day 38	--continue--	
Day 39	Kepler's laws and equations	
Day 40	--continue--	
Day 41	--continue--	
Day 42	artificial satellites	
Day 43	--continue--	
Day 44	Rutherford scattering	
Day 45	-continue--	
Day 46	**Class Test: 02**	
Day 47	Variational Principle	
Day 48	-continue--	
Day 49	-continue--	
Day 50	**Unit III: Equation of motion**	
Day 51	derivation of equations of motion	
Day 52	**Second Assignment**	
Day 52	--continue--	
Day 53	--continue--	
Day 54	- variation and end points	
Day 55	Hamilton's principle and characteristic functions	
Day 56	--continue--	

Day 57	Hamilton-Jacobi Equation	
Day 58	--continue--	
Day 59	--continue--	
Day 60	--continue--	
Day 61	Numerical based on above topics	
Day 62	Numerical based on above topics	
Day 63		
Day 64	**Class Test: 03**	
Day 65	**Unit IV: Small Oscillations**	
Day 66	small oscillations	
Day 67	--continue--	
Day 68	--continue--	
Day 69	normal modes and coordinates	
Day 7o	--continue--	
Day 71	**Third Assignment**	
Day 72	normal modes and coordinates	
Day 73	Canonical transformation	
Day 74	--continue--	
Day 75	generating functions	
Day 76	properties of Poisson bracket	
Day 77	**Third Assignment**	

Day 78	09/11/2019	--continue--	
Day 79	11/11/2019	Solution of Previous Year Question Papers	
Day 80	12/11/2019	--continue--	

LESSON PLAN

Name of the Assistant/ Associate professor:**Mr. Sandeep Singh**
Class and Section:**M.Sc. Physics 1st semester**
Subject:**Quantum Mechanics-1 (PHY(H)-103)**

Day	Topic
1	**Unit-1 General Formalism of Quantum Mechanics:** Introduction to Quantum Mechanics
2	Linear Vector Spaces
3	Continue
4	Continue
5	Linear Operators
8	States and Operators
9	Representation of States and Dynamical variables, Bra-Ket notation
10	Ortho-normal set of vectors, Completeness relation
11	Eigen Values and Eigen Vectors, Nature of quantum mechanical operators
12	Continue
13	The fundamental commutation relation and rules, The uncertainty relation
14	Simultaneous eigen states of commuting operators, The unitary transformation
15	Dirac delta function
16	Matrix representation of operators
17	Solution of L.H.O. by operator method
18	Problems on L.H.O. in NET EXAM
19	**Unit-11 Angular Momentum Operator:** Angular momentum operators and their representation in spherical polar co-ordinates
20	Continue and Minor Exam –I result shown
21	Continue
22	Eigen values and eigen vectors of $\mathbf{L^2}$ operator
23	Continue
24	Commutation relation among $\mathbf{L_x}$, $\mathbf{L_y}$, $\mathbf{L_z}$ operators
25	Continue
26	Rotational Symmetry and conservation of angular momentum
27	Continue
28	Eigen values of $\mathbf{J^2}$ and $\mathbf{J_z}$ and their matrix representation
29	Pauli Spin Matrices
30	Continue
31	Addition of angular momentum
32	Continue
33	Problems in NET EXAM related to unit-II
34	**Minor Exam-II and Assignment-I**
35	**Unit-III Solution of Schrodinger equation for 3-dimensional problems:** Minor Exam –II result will be declared and question paper will be discussed

36	3-dim Harmonic Oscillator in both Cartesian Coordinate System
37	3-dim Harmonic Oscillator in Spherical Polar Coordinate System
38	Solution of Hydrogen atom problem
39	Continue
40	Problems in NET EXAM related to Unit-III
41	Continue
42	Continue
43	Continue ; **Assignment –II** will be given
44	**Unit-IV Perturbation Theory** Time independent perturbation theory (Non-degenerate theory)
45	The energy and wave function in 1^{st}order; The energy in 2^{nd} order
46	Continue
47	Continue
48	Anharmonic Perturbations of the form λx^3 and λx^4
49	Degenerate Perturbation theory
50	Stark effect of the first excited state of Hydrogen
51	Problems in NET EXAM related to Unit-IV
52	Continue
53	Continue
54	Continue
55	Continue
56	Continue
57	**Major Exam**will be taken
58	**----------**
59	**----------**
60	**Question Papers of last years will be solved**

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Lesson plan

M. Sc. Physics (Semester: I)

Paper II Electronics (PHY (H) - 104)

Day No.	Particular	Remarks
Day 1	Basics of Electronics	
Day 2	--continue--	
Day 3	--continue--	
Day 4	Bipolar junction Transistor(BJT)	
Day 5	--continue--	
Day 6	Transistor operating modes	
Day 7	--continue--	
Day 8	Transistor action	
Day 9	--continue--	
Day 10	--continue--	
Day 11	Transistor biasing configuration	
Day 12	--continue--	
Day 13	Its characterisrics	
Day 14	--continue--	
Day 15	--continue--	
Day 16	--continue--	
Day 17	Transistor ratings	
Day 18	The Ebers-Moll model	
Day 19	Field Effect Transistors	
Day 20	--continue--	
Day 21	--continue--	
Day 22	Metal Oxide Semiconductor Field Effect Transistor (MOSFET)	
Day 23	--continue--	
Day 24	--continue--	
Day 25	**Unit II: Integrated circuits and Their Fabrications**	
Day 26	Types of Integrated Circuits	
Day 27	--continue--	
Day 28	**Class Test: 01**	
Day 29	Analog and Digital Integrated Circuits	
Day 30	**First Assignment**	
Day 31	Semiconductor Fabrication	
Day 32	Planar Technology	
Day 33	--continue--	
Day 34	Fabrication of Monolithic	
Day 35	--continue--	
Day 36	Integrated Circuits	
Day 37	--continue--	
Day 38	monolithic passive & active circuit components	
Day 39	--continue--	
Day 40	Typical IC Low Frequency Amplifier	

Day 41	--continue--	
Day 42	New Technology Trends	
Day 43	--continue--	
Day 44	--continue--	
Day 45	**Unit III: Photoelectric and other Electronic Devices**	
Day 46	Zener Diode	
Day 47	**Class Test: 02**	
Day 48	Zener Diode	
Day 49	Power Diode	
Day 50	--continue--	
Day 51	Photodiode	
Day 52	--continue--	
Day 53	**Second Assignment**	
Day 54	Varactor Diode	
Day 55	--continue--	
Day 56	Light Emitting Diode (LED)	
Day 57	--continue--	
Day 58	Solar Cell	
Day 59	--continue--	
Day 60	Varactor Liquid Crystal Display Transistor Register	
Day 61	Piezo-electric Crystals	
Day 62	Diode Lasers, Condition for Laser Action	
Day 63	--continue--	
Day 64	Memory Devices	
Day 65	--continue--	
Day 66	**Class Test: 03**	
Day 67	**Unit IV: Negative Resistance Devices**	
Day 68	Tunnel Diode	
Day 69	--continue--	
Day 70	Backward Diode	
Day 71	Unijunction Transistor, p -n-p-n devices	
Day 72	Thyrostor	
Day 73	**Third Assignment**	
Day 74	Silicon Controlled Switch and characteristics	
Day 75	L Addition four Layer Devices	
Day 76	Basic Circuit Principles for NR Switching Circuits	
Day 77	Monostable Operation	
Day 78	Bistable Operation	
Day 79	**Third Assignment**	
Day 80	Astable Operation	
Day 81	Solution of Previous Year Question Papers	
Day 82	--continue--	