Lesson Plan (AY 2020-21)

Name of the Department : Physics

PP - Dr. Pratibha Pal, GP - Dr. Gayatri Pal,
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Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
I	**Hons**	CC – 1 (Theory) **(Mathematical Physics -I)**	1 a and b (Calculus)	KB	10
			1 c and d (Calculus)	SDG	10
			2 (Vector Algebra and Vector Calculus)	SC	25
			3 (Matrices)	SDG	15
		CC-1 (Practical)	1 Introduction to plotting graphs with GNU Plot	SC	09
			2 Introduction to programming in Python	SDG	51
		CC – 2 (Theory) **(Mechanics)**	1 (Fundamentals of Dynamics)	GP	12
			2 (Work and Energy)	GP	8
			3 (Gravitation and Central Force Motion)	GP	10
			4 (Non-inertial Systems)	PP	12
			5 (Rotational Dynamics)	KB	12
			6 (Fluid Motion)	PP	6
		CC-2 (Practical)	General topics, Measurement of Moment of inertia of a wire, Flywheel, Young's Modulus measurement (method of flexure and Searl's), determination of g using bar pendulum, height measurement using sextant.	SB +PP	30 + 30
	Gen	GE-1/CC-1 (Theory) **(Mechanics)**	1 (Mathematical Methods)	SDG	15
			2 (Introduction to Newtonian Mechanics)	GP	5
			3 (Rotational Motion)	GP	10
			4 (Central Force and Gravitation)	SDG	10
			5 (Oscillations)	KB	9
			6 (Elasticity)	KB	6
			7 (Surface Tension)	KB	5
		GE-1/CC-1 (Practical)	General topics, Measurement of Moment of inertia of a, Flywheel, Rigidity modulus measurement, Young's Modulus measurement (method of flexure), determination of g using bar pendulum,.	SB	60

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
II	**Hons**	CC – 3 (Theory) **(Electricity and Magnetism)**	1 (Dirac Delta function and it's properties)	SC	3
			2 (Electrostatics)	KB	12
			3 (Dielectric Properties of Matter)	KB	6
			4 (Method of images)	KB	4
			5 (Electrostatic energy)	KB	3
			6 (The Magnetostatic Field)	GP	10
			7 (Magnetic Properties of Matter)	GP	7
			8 (Electro-magnetic Induction)	GP	7
			9 (Electrical Circuits)	SC	8
		CC – 3 (Practical)	Low resistance measuremnt using Carey Foster bridge and potentiometer. Study of series LCR and ac response of RC circuit, mutual inductance and magnetometer.	SB +GP	30 + 30
		CC – 4 (Theory) **(Waves and Optics)**	1 (Oscillation)	PP	8
			2 (Superposition of Harmonic Oscillation)	PP	4
			3 (Wave motion)	PP	4
			4 (Superposition of Harmonic waves)	PP	9
			5 (Wave Optics)	SDG	4
			6 (Interference)	SDG	10
			7 (Interferometers)	SDG	5
			8 (Diffraction)	SDG	16
		CC-4 (Practical)	Meldey's Experiment, Determination of Cauchy constants, Fresnel biprism, Newton's ring, wedge shaped film and Diffraction grating experiments.	SDG	60
	Gen	GE-2/CC-2 (Theory) **(Electricity and Magnetism)**	1 (Essential Vector Analysis)	SC	5
			2 (Electrostatics)	SC	25
			3 (Magnetism)	GP	15
			4 (Electromagnetic Induction)	GP	5
			5 (Electrodynamics)	GP	10
		GE-2/CC-2 (Practical)	Carey Fosters bridge, Potentiometer, magnetometer, ammeter to voltmeter conversion and the vice versa.	SB	60
III	**Hons**	CC – 5 (Theory) **(Mathematical Physics -II)**	1 (Fourier Series)	SC	10
			2 (Frobenius Method and Special Functions)	KB	20
			3 (Some Special Integrals)	KB	4
			4 (Integral Transforms)	SC	10
			5 (Introduction to Probablity)	SC	6
			6 (Partial Differential Equations)	SDG	10

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
III	**Hons.**	CC – 5 (Practical)	1 (Introduction to numpy and scipy)	KB	50
			2 (Introduction to matplotlib)	KB	10
		CC – 6 (Theory) **(Thermal Physics)**	1 (Introduction to Thermodynamics)	PP	25
			2 (Thermodynamic Potentials)	PP	15
			3 (Kinetic Theory of Gases)	SDG	15
			4 (Conduction of Heat)	SDG	5
		CC-6 (Practical)	Optical Lever, Thermal coefficient of resistance by Carey Foster bridge, Lee's method, Thermocouple and Platinum Resistance Thermometer.	SB + PP	30 + 30
		CC – 7 (Theory) **(Modern Physics)**	1 (Radiation and its nature)	GP	15
			2 (Basics of Quantum Mechanics)	GP	15
			3 (Nuclear Structure)	GP	10
			4 (Interaction with and within nucleus)	GP	12
			5 (Lasers)	SDG	8
		CC – 7 (Practical)	Planck's constant using LED, verification of Stefan's Law, e/m of electrons using bar magnet, study of photoelectric effect and tunneling effect.	SB + SC	30 + 30
		SECA -1 (Theory) **(Scientific Writing)**	Introduction to LATEX, Document Classes, Page Layout, List Structures, Representation of Mathematical Equations, customization of fonts, Writing tables, figures.	SDG	15
		SECA -1 (Project)	Writing articles/reports, research papers, mathematical derivations, resume, laboratory note book, graphical analysis etc.	SDG	15
	Gen	GE-3/ CC-3 (Theory) **(Thermal Physics and Statistical Mechanics)**	1 (Laws of Thermodynamics)	PP	18
			2 (Thermodynamic Potentials)	PP	9
			3 (Kinetic Theory of Gases)	SDG	10
			4 (Theory of Radiation)	SDG	8
			5 (Statistical Mechanics)	GP	15
		GE-3/ CC-3 (Practical)	Optical Lever, Verification of Stefan's Law, Thermal coefficient of resistance by Carey Foster bridge, Lee's method and Jolly's apparatus.	SB	60

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
III	**Gen**	SECA -1 (Theory) **(Scientific Writing)**	Introduction to LATEX, Document Classes, Page Layout, List Structures, Representation of Mathematical Equations, customization of fonts, Writing tables, figures	SDG	15
		SECA -1 (Project)	Writing articles/reports, research papers, mathematical derivations, resume, laboratory note book, graphical analysis etc	SDG	15
IV	**Hons**	CC – 8 (Theory) **(Mathematical Physics -III)**	1 (Complex Analysis)	KB	20
			2 (Variational Calculus in Physics)	SC	20
			3 (Special Theory of Relativity)	PP	20
		CC – 8 (Practical)	1 (Exploring Gaussian Integral and the delta function)	KB	11
			2 (Solutions of Differential Equation)	KB	9
			3 (Special Functions)	KB	9
			4 (Solution of some PDEs)	KB	25
			5 (Fourier Series)	KB	5
		CC – 9 (Theory) **(Analog Electronics)**	1 (Circuits and Network)	GP	4
			2 (Semiconductor Diode and Applications)	GP	8
			3 (Bipolar Junction Transistors and Biasing)	GP	10
			4 (Field Effect Transistors)	GP	5
			5 (Regulated Power Supply)	GP	3
			6 (Amplifiers)	GP	5
			7 (Feedback amplifiers and OPAMP)	GP	15
			8 (Multivibrator)	GP	5
			9 (Oscillator)	GP	5
		CC-9 (Practical)	Zener diode, CE amplifier, regulated power supply, OPAMP and Wein Bridge	SB + GP	30 + 30
		CC – 10 (Theory) **(Quantum Mechanics)**	1 (Wavepacket Description)	SDG	5
			2 (General discussion of bound states in an arbitrary potential)	SDG	8
			3(Quantum Mechanics of simple harmonic oscillator)	SDG	6
			4 (Quantum Theory of Hydrogen- like atoms)	SDG	8
			5 (Generalized angular momentum and spin)	PP	10
			6 (Spectra of Hydrogen atom and its fine structure)	PP	5
			7 (Atoms in Electric & Magnetic Fields)	PP	8
			8 (Many electron atoms)	PP	10

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
IV	**Hons.**	CC-10 (Practical)	1(Finding eigenstates using transcendental equations)	KB	9
			2 (Use of shooting algorithm)	KB	27
			3 (Time evolution of wavepacket)	KB	24
		SECB1 (Theory) **(Arduino)**	1 (Introduction to Arduino)	SC	2
			2 (Basic Ideas)	SC	3
			3 (Arduino Programming)	SC	10
		SECB1 (Project)	LED blinking and fading, measurement of voltage, interfacing 7 segment display, constructing thermometer, data logger and study of simple pendulum to measure g.	SDG	15
	Gen	GE-4/CC-4 (Theory) **(Waves and Optics)**	1 (Acoustics)	PP	10
			2 (Superposition of Vibrations)	PP	5
			3 (Vibration in a String)	PP	8
			4 (Introduction to wave optics)	SDG	2
			5 (Interference)	SDG	15
			6 (Diffraction)	SDG	10
			7 (Polarization)	PP	10
		GE-4/CC-4 (Practical)	Focal length by Auxiliary method, sonometer, Newton's ring, wedge shaped film and polarimeter.	SDG	60
		SECB1 (Theory) **(Arduino) [Either sem 4 or sem6]**	1 (Introduction to Arduino)	SC	2
			2 (Basic Ideas)	SC	3
			3 (Arduino Programming)	SC	10
		SECB1 (Project) **[Either sem 4 or sem6]**	LED blinking and fading, measurement of voltage, interfacing 7 segment display, constructing thermometer, data logger and study of simple pendulum to measure g.	SDG	15
V	**Hons.**	CC – 11 (Theory) **(Electromagnetic Theory)**	1 (Maxwell equations)	SC	12
			2 (EM wave propagation in unbounded media)	SC	10
			3 (EM wave in bounded media)	SC	10
			4 (Polarization)	SC	7
			5 (Polarization in uniaxial crystals)	SC	15
			6 (Rotatory Polirazition)	SC	6
		CC-11 (Practical)	Brewster's angle, Fresnel's law and Malus verification, polarimeter, dispersive power of grating.	SDG	60

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
V	**Hons.**	CC – 12 (Theory) **(Statistical Physics)**	1 (Classical Statistical Mechanics)	GP	25
			2 (System of Identical Particles)	GP	6
			3(Bose Einstein Statistics)	GP	12
			4 (Radiation : classical and quantum Aspects)	GP	7
			5 (Fermi-Dirac Statistics)	GP	10
		CC-12 (Practical)	1(Study of Random numbers and Time series)	KB	20
			2 (Application of Random numbers)	KB	28
			3 (Scaling and plots, exponents and parameters)	KB	12
		DESA1 b (Theory) **(Laser and Fiber Optics)**	1 (Einstein coefficients and Rate equations)	SDG	20
			2 (Basic properties of laser)	SDG	4
			3 (Resonators)	SDG	8
			4 (Transient effect)	SDG	5
			5 (Basic Laser Systems)	SDG	7
			6 (Practical properties and use of laser)	SDG	5
			7 (Fiber optics)	KB	12
			8 (Holography)	KB	4
			9 (Introductory Nonlinear Optics)	KB	10
		DESA1 b (Tutorial)	Assignments	SDG + KB	10 +5
		DSEB1 b (Theory) **(Nuclear and Particle Physics)**	1 (Introduction)	PP	5
			2 (Nuclear Reactions)	PP	10
			3 (Interactions of Nuclear Radiation with matter)	PP	15
			4 (Detector for Nuclear Radiation)	PP	15
			5 (Particle Accelerators)	PP	15
			6 (Particle Physics)	PP	15
		DESB1 b (Tutorial)	Assignments	PP	15
	Gen	DSE - A (1) (Theoy) **(Analog Electronics)**	1 (Circuits and Network)	SC	6
			2 (Semiconductor Devices)	SC	20
			3 (Regulated Power Supply)	SC	4
			4 (Field Effect Transistors)	SC	5
			5 (Feedback Amplifiers)	SC	5
			6 (Operational Amplifiers)	SC	15
			7 (Sinusoidal Oscillators)	SC	5
		DSE - A (1) (Practical)	Verification of Thevenin, Norton's Theorem, Characteristics of Photo transistor, Characteristics of CE transistor, Construction of regulated power supply and study of OPAMP.	SB + SC	30 + 30

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
V	**Gen**	SECA -1 (Theory) **(Scientific Writing) [Either sem 3 or sem5]**	Introduction to LATEX, Document Classes, Page Layout, List Structures, Representation of Mathematical Equations, customization of fonts, Writing tables, figures.	SDG	15
		SECA -1 (Project) **[Either sem 3 or sem5]**	Writing articles/reports, research papers, mathematical derivations, resume, laboratory note book, graphical analysis etc	SDG	15
VI	**Hons.**	CC - 13 (Theory) **(Digital Systems and Applications)**	1 (Integrated Circuits)	GP	5
			2 (Number System)	GP	7
			3 (Digital Circuits)	GP	16
			4 (Implementation of different circuits)	GP	6
			5 (Data processing circuits)	GP	5
			6 (Sequential circuits)	GP	6
			7 (Registers and Counters)	GP	6
			8 (Computer Organization)	GP	6
			9 (Data conversion)	GP	3
		CC - 13 (Practical)	Basic and universal gates, Half and Full adder, SR, D, JK, Flipflops using NAND, 4 bit shift register, 4x1 multiplexer.	SB +GP	30 + 30
		CC - 14 (Theory) **(Solid State Physics)**	1 (Crystal Structure)	PP	12
			2 (Elementary Lattice Dynamics)	PP	10
			3 (Magnetic properties of Matter)	PP	8
			4 (Dielectric Properties of Materials)	PP	8
			5 (Drude's Theory)	PP	4
			6 (Elementary Band Theory)	SDG	12
			7 (Superconductivity)	PP	6
		CC - 14 (Practical)	BH Loop, Dielectric constant, band gap and Hall effect by four probe, Temperature controller and Magnetic Susceptibility.	SB+SC	30 + 30
		DSE- A2 (a) (Theory) **Nano materials and Applications**	1 (Nanoscale Systems)	SDG	10
			2 (Synthesis of Nanostructure Materials)	KB	15
			3 (Characterization)	KB	10
			4 (Optical Properties)	SDG	15
			5 (Electron Transport)	SDG	10
			6 (Applications)	KB	15
		DSE- A2 (a) (Tutorial)	Assignments	SDG +KB	7+8

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VI	**Hons.**	DSE- B2 (a) (Theory) **(Communication Electronics)**	1 (Electronic Communication)	SC	10
			2 (Analog Modulation)	SC	15
			3 (Analog Pulse Modulation)	SC	10
			4 (Digital Pulse Modulation)	SC	15
			5 (Introduction to Communication and Navigation System)	SC	25
		DSE- B2 (a) (Tutorial)	Assignments	SC	15
	Gen	DSE - B (1) (Theoy) **(Digital Electronics)**	1 (Integrated Circuits)	GP	4
			2 (Number System)	SDG	7
			3 (Digital Circuits)	SDG	20
			4 (Data Processing Circuits)	SC	5
			5 (Sequential Circuits)	SC	12
			6 (Registers and Counters)	GP	12
		DSE - B (1) (Practical)	Basic and universal gates, Half and Full adder, SR, D, JK, Flipflops using NAND, 4 bit shift register, 4x1 multiplexer.	SB+SC	30 + 30
		SECB1 (Theory) **(Arduino) [Either sem 4 or sem6]**	1 (Introduction to Arduino)	SC	2
			2 (Basic Ideas)	SC	3
			3 (Arduino Programming)	SC	10
		SECB1 (Project) **[Either sem 4 or sem6]**	LED blinking and fading, measurement of voltage, interfacing 7 segment display, constructing thermometer, data logger and study of simple pendulum to measure g.	SDG	15