Lesson Plan
MCM DAV College for Women, Sector – 36A, Chandigarh
Monthly Teaching Plans (Odd Semester/Even Semester)
Session – (2023-2024)
Odd Semester

Name of the Teacher: Dr. Kulwinder Kaur
Department: Physics Department
Paper V
Class: B.Sc. III Hons.   **Subject: Physics of Semiconductors**

S. No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	**To**		
1	21/07/2023	15/8/2023	Semiconductor materials, Crystal lattices, Ge and Si crystal structure, production of electronic grade Si, Bulk crystal growth, Epitaxial growth, Bonding forces and energy bands in solids, Metals, semiconductors and insulators, Direct and Indirect semiconductors, intrinsic and extrinsic semiconductors, compensation, Electrons and holes, effective mass	Lecture Method, PPT, Online Sources, Group Discussion
2	16/8/2023	15/9/2023	Fermi level, Conductivity and mobility, temperature dependence of Carrier concentration, effect of temperature, doping and field on mobility, Hall effect, Invariance of Fermi level at equilibrium. Excess carriers in semiconductors: Optical absorption, Photoluminescence, Electroluminescence, Carrier lifetime and photoconductivity	Lecture Method, PPT, Online Sources, Group Discussion
3	16/9/2023	15/10/2023	photoconductive devices, Diffusion and drift of carriers: Einstein relation, built-in fields in semiconductors with different doping profiles, energy band diagrams. Steady state carrier injection, diffusion length, Haynes-Shockley experiment (qualitative discussion)	Lecture Method, PPT, Online Sources, Group Discussion
4	16/10/2023	31/10/2023	pn junction energy band diagrams forward and reverse-biased junction, calculation of contact potential and depletion width in abrupt junction, diffusion and drift currents, Reverse-bias breakdown,	Lecture Method, Online Sources, Group Discussion
5	1/11/2023	18/11/2023	Zener and Avalanche diode. Diffusion and depletion capacitance of pn junction, varactors. Metal-semiconductor contacts, energy band diagrams of ohmic and rectifying contacts, Schottky diodes	Lecture Method, Online Sources, Group Discussion

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Name of the Teacher: <u>Dr. R. Ridhi</u>
Department: <u>Department of Physics</u>
Paper VI
Class: <u>B.Sc. III (Hons.) Vth Semester</u>   **Subject:** <u>Computational Physics</u>   **Section:** <u>Hons</u>

S. No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken *
1.	24/7/2023	30/8/2023	Types of Computer Systems and Operating Systems, Introduction to Programming: Algorithms, Structured Programming. Basic idea of Compilers, Data and Statements: Data Types. Constants and Variables. Mathematical, Relational, Logical and Bitwise Operators. Expressions and Statements. Block, Local and Global variables. Auto, Static and External Variables	(i) Lecture method (ii) Group discussion (iii) Notes (iv) Programming codes explanations
2.	01/09/2023	30/09/23	I/O Statements: printf, scanf, getc, getch, getchar, getche, etc. Manipulators for Data Formatting: setw, width, endl and setprecision etc. ASCII Files I/O.Preprocessor: #include and #define directives. Control Statements: - If-statement. If-else Statement. Nested if Structure. Else-if Statement.	(i) Lecture method (ii) Group discussion (iii) Notes (iv) Programming codes explanations
2.	01/10/2023	31/10/2023	Ternary Operator. Go to Statement. Switch Statement. Unconditional and Conditional Looping. While Loop. Do-while Loop. For Loop. Break and Continue Statements. Nested Loops. Arrays and Structures: - One- and Two-Dimensional Arrays. Idea of Structures, Strings and Pointers, Functions: Standard Library Functions and User-defined Functions. Functions returning Values. Function Prototypes. Function Call by Value and by Reference, Recursion	(i) Lecture method (ii) Group discussion (iii) Notes (iv) Programs practice and explanation
3.	01/11/23	18/11/23	Design of algorithm and computer programs based on the numerical techniques read in Paper III "Statistics and Numerical Techniques", Programs: (a) Data handling: find standard deviation, mean, variance, moments etc., (b) the least squared fitted curve for a data set, (c) roots of quadratic equations, (d) first order derivative at given x for a data set using Lagrange interpolation, (e) numerical integration on 1-D function using Simpson methods, (f) solving a differential equation using Euler/Runge-Kutta method, (g) Sum, Difference and Product of Matrices, (h) determinant of a matrix - its eigenvalues and eigenvectors.(h)Plotting and evaluation of mathematical functions.	(i) Lecture method (ii) Group discussion (iii) Notes (iv) Numerical (v) Class tests (vi) Doubt sessions

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Monthly Teaching Plans (Even Semester)
Session – (2023-2024)

Name of the Teacher: **Dr. R. Ridhi**
Department: **Department of Physics**
Paper VII
Class: B.Sc. III Hons. VIth Semester   **Subject: Nuclear Radiations and Detection**

S. No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	**To**		
1	09/01/2024	31/01/2024	**Radioactive decays**: Alpha decay, β - , β+ and EC decays, Radioactivity units, gamma rays, Internal conversion, X-rays, Auger electron, Bremesstrahlung, Annhilation radiation. **Neutron sources**- fission, radioisotope based sources and photoneutron sources, Accelerator based sources. **Radiation Interactions**: Interaction of light and heavy Charged Particles, Stopping power, energy and range straggling.	Lecture Method, PPT, Online Sources, Group Discussion, Class tests and doubt sessions
2	01/02/2024	29/02/2024	Interaction of Fast Electrons- ionsation and radiative loss, backscattering. Interaction of Gamma rays, photoelectric absorption, Compton scattering and pair production. Attenuation coefficient. Interaction of Neutrons, Slowing down power, thermal neutrons, Sources of Background: Natural radioactivity, Air borne radioactivity, Primary and secondary Cosmic rays. General Properties of Radiation Detectors: Modes of detector operation, Currentmode, pulse mode, Pulse Height Spectra	Lecture Method, PPT, Online Sources, Group Discussion, Class tests and doubt sessions
3	01/03/2024	31/03/2024	Energy Resolution, DetectionEfficiency, Dead Time- paralyzable and non- paralyzable models, Radiation Detectors: Ionization process in gases, Ion pair formation, fano factor, diffusion, charge transfer and recombination, Charge Migration and Collection. Gas-filled detectors: Gas Multiplication,avalanche formation, Regions of detector operation.	Lecture Method, PPT, Online Sources, Group Discussion, Class tests and doubt sessions
4	01/04/2024	22/04/2024	Proportional Counters, fill gases and choice of geometry. Geiger-Mueller counter, Fill Gases and Quenching mechanism, Recovery time and dead time, detection of charged particles, gamma and neutrons rays with G.M. counter, Scintillation Detectors: Organic and Inorganic Scintillators; Characteristics and parameters associated with Gamma ray spectrum Semiconductor detectors. Detection of slow and fast neutrons by neutron- induced reactions	Lecture Method, Online Sources, Group Discussion, Class tests and doubt sessions