

**E.M. GOPALAKRISHNA KONE YADAVA WOMEN'S COLLEGE**

**An Autonomous Institution -Affiliated to Madurai Kamaraj University**

**Re-accredited (3<sup>rd</sup> Cycle) with Grade A<sup>+</sup> & CGPA 3.51 by NAAC**



**LESSON PLAN**

**2023-2024**

**DEPARTMENT OF PHYSICS**

**(UG & PG – Odd Semester)**



**E.M.GOPALAKRISHNA KONE YADAVA WOMEN'S COLLEGE**  
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**LESSON PLAN**

**2023-2024**

**Class : I B.Sc Physics**  
**Sub. Code : 23OUPH11**

**Semester : I**

**Title of the Paper: Properties of Matter and Acoustics**

**Total Hours: 60 Hours**

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Unit :I ELASTICITY:</b> Hooke's law – stress-strain diagram – elastic constants –Poisson's ratio – relation between elastic constants and Poisson's ratio – work done in twisting a wire - twisting couple on a cylinder – rigidity modulus by static torsion-torsional pendulum (with and without masses)	12	Chalk & Talk	<i>M.A.</i>
July	II	<b>Unit :II BENDING OF BEAMS:</b> cantilever– expression for Bending moment – expression for depression at the loaded end of the cantilever– oscillations of a cantilever – expression for time period –experiment to find Young's modulus – non-uniform bending– experiment to determine Young's modulus by Koenig's method – uniform bending – expression for elevation – experiment to determine Young's modulus using microscope.	12	Chalk & Talk	<i>E. Charis Monica</i>
August	III	<b>Unit:III FLUID DYNAMICS:</b> <i>Surface tension:</i> definition – molecular forces– excess pressure inside a curved liquid surface – application to spherical and cylindrical drops and bubbles – determination of surface tension by Jaegar's method–variation of surface tension with temperature. <i>Viscosity:</i> definition – streamline and turbulent flow – rate of flow of liquid in a capillary tube – Poiseuille's formula –corrections – terminal velocity and Stoke's formula– variation of viscosity with temperature	12	Chalk & Talk	<i>M.A.</i>
September	IV	<b>Unit :IV WAVES AND OSCILLATIONS:</b> Simple Harmonic Motion (SHM) – differential equation of SHM – graphical representation of SHM – composition of two SHM in a straight line and at right angles – Lissajous's figures- free, damped, forced vibrations - resonance and sharpness of resonance-Laws of transverse vibration of strings – <i>sonometer</i> : determination of AC frequency using sonometer – determination of frequency using Melde's string apparatus.	12	Chalk & Talk	<i>E. Charis Monica</i>
October	V	<b>Unit :V ACOUSTICS OF BUILDINGS AND ULTRASONICS</b> Intensity of sound – decibel – loudness of sound–reverberation–Sabine's reverberation formula – acoustic intensity – factors affecting the acoustics of buildings. <i>Ultrasonic waves:</i> production of ultrasonic waves – Piezoelectric crystal method – magnetostriction effect – application of ultrasonicwaves.	12	Chalk & Talk	<i>M.A.</i>

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**LESSON PLAN**  
**2022-2023**

Class : I BSc.,Physics

Sub. Code : 23OUPHFC1

Title of the Paper: Introductory physics

Semester : I

Total Hours : 30 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	Vectors, scalars –examples for scalars and vectors from physical quantities – addition, subtraction of vectors – resolution and resultant of vectors – units and dimensions– standard physics constants.	6	Chalk & Talk	<i>M.A.A. / P.H.</i>
July	II	Different types of forces–gravitational, electrostatic, magnetic, electromagnetic, nuclear –mechanical forces like, centripetal, centrifugal, friction, tension, cohesive, adhesive forces.	6	Chalk & Talk	<i>M.A.A. / P.H.</i>
August	III	Different forms of energy– conservation laws of momentum, energy –types of collisions –angular momentum– alternate energy sources–real life examples.	6	Chalk & Talk	<i>S.K.J.</i>
September	IV	Types of motion– linear, projectile, circular, angular, simple harmonic motions – satellite motion – banking of a curved roads –stream line and turbulent motions – wave motion – comparison of light and sound waves – free, forced, damped oscillations.	6	Chalk & Talk	<i>S.K.J.</i>
October	V	Surface tension – shape of liquid drop – angle of contact – viscosity–lubricants – capillary flow – diffusion – real life examples– properties and types of materials in daily use– conductors, insulators– thermal and electric.	6	Chalk & Talk	<i>S.K.J.</i>

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**LESSON PLAN**  
**2022-2023**

Class : I BSc.,Physics  
Sub. Code : 23OUPHSECN1  
Title of the Paper: Physics For Everyday Life

Semester : I  
Total Hours : 30 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>MECHANICAL OBJECTS:</b> spring scales – bouncing balls –roller coasters – bicycles –rockets and space travel.	6	Chalk & Talk	M.A. #1
July	II	<b>OPTICAL INSTRUMENTS AND LASER:</b> vision corrective lenses– polaroid glasses – UV protective glass – polaroid camera – color photography – holography and laser.	6	Chalk & Talk	M.A. #1
August	III	<b>PHYSICS OF HOME APPLIANCES:</b> bulb – fan – hair drier –television – air onditioners – microwave ovens – vacuum cleaners	6	Chalk & Talk	S. Huj
September	IV	<b>SOLAR ENERGY:</b> Solar constant – General applications of solarenergy – Solar water heaters – Solar Photo – voltaic cells – General applications of solar cells.	6	Chalk & Talk	S. Huj
October	V	<b>INDIAN PHYSICIST AND THEIR CONTRIBUTIONS:</b> C.V.Raman, Homi Jehangi rBhabha, Vikram Sarabhai, Subrahmanyam Chandrasekhar, Venkatraman Ramakrishnan, Dr. APJ Abdul Kalam and their contribution to science and technology.	6	Chalk & Talk	M.A. #1 S. Huj

  
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**LESSON PLAN**  
**2023-2024**

Class : II B.Sc Physics  
 Sub. Code : 22OUPH31

Title of the Paper: Electricity and Electromagnetism

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Magnetic Effect of Electric Current</b> Magnetic flux and magnetic induction - Biot Savart law- magnetic induction at a point due to a straight conductor carrying current - magnetic induction at a point on the axis of a circular coil carrying current- torque on a current loop in a uniform magnetic field - amperes circuital law- Moving coil Ballistic galvanometer-theory -experiment to find charge sensitivity.	12	Chalk & Talk	P.R.L.
July	II	<b>Thermal Effect of Electric Current</b> Thermoelectricity- Seebeck effect- laws of thermo e.m.f.-measurement of thermo e.m.f using potentiometer-Peltier effect-demonstration-Thomson effect- demonstration - Thermodynamics of thermo couple -Thermo electric diagram -uses-applications.	12	Chalk & Talk	P.R.L.
August	III	<b>Electromagnetic Induction</b> Faraday's laws of electromagnetic induction-self induction -self inductance of a long solenoid -toroidal solenoid-determination of L by Rayleigh's methods-Owen's bridge-mutual induction-mutual inductance between two co-axial solenoids-experimental determination of mutual inductance --co-efficient of coupling- energy stored in a coil- eddy currents and its uses.	12	Chalk & Talk	<i>[Signature]</i>
September	IV	<b>AC And DC Circuits</b> Growth and decay of current in LC, LR and CR circuits with d.c.voltages - determination of high resistance by leakage- Alternating Current- j operator method -use of j operator in the study of AC circuits-LCR series resonance circuit -parallel resonane circuit -power in an AC circuit.	12	Chalk & Talk	<i>[Signature]</i>
October	V	<b>Maxwell's Equations &amp; Electromagnetic Waves</b> Introduction-Physical significance of Maxwell's equations- -Displacement current- Plane electromagnetic waves in free space- Propagation of electromagnetic wave through a homogeneous, isotropic dielectric medium-Energy density of electromagnetic wave and Poynting theorem.	12	Chalk & Talk	P.R.L. <i>[Signature]</i>

Semester : III  
 Total Hours : 60 Hours

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**LESSON PLAN**  
**2023-2024**

Class : III B.Sc Physics  
 Sub. Code : 21P51

Title of the Paper: Atomic and Nuclear Physics

Semester : V

Total Hours : 60 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Atomic Structure</b> Thomson Model of the Atom-Rutherford experiment- Scattering of $\alpha$ particles and Rutherford model of the atom-Rutherford scattering of $\alpha$ particles- Bohr model of the atom-Bohr's theory of the hydrogen spectrum-Spectral lines for hydrogen atom-Energy level of hydrogen atom - Resonance Excitation and Ionization potential.	12	Chalk & Talk	<i>S. Parinigh</i>
July	II	<b>Vector Atom Model</b> Vector atom model- Spinning electron-Quantum numbers associated with the vector atom model- Coupling schemes- Applications of spatial quantization- Application of the vector model- Pauli's exclusion principle- Electronic structure in atom-Example of electronic configurations- Fine structure of spectral lines-optical spectra-Fine structure.	12	Chalk & Talk	<i>S. Parinigh</i>
August	III	<b>Nucleus &amp; Nuclear Models</b> Introduction-Historical Developments- Constituents of the nucleus- Quantitative facts about nucleus- Binding energy- Nuclear angular momentum- Nuclear moments- wave mechanical properties-Yukawa theory of nuclear forces- Liquid drop model-Shell model- Fermi gas model- Collective model.	12	Chalk & Talk	<i>S. Parinigh</i>
September	IV	<b>Particle Accelerators &amp; Radiation Detectors</b> Introduction- Cockcroft and Walton Accelerator- Betatron- Synchrocyclotrons- Synchrotrons- Ionization Chamber- Scintillation Detectors- Cloud Chamber- Bubble Chamber - Spark Chamber.	12	Chalk & Talk	<i>S. Parinigh</i>
October	V	<b>Particle physics</b> Introduction- Production of elementary particles- Types of interactions- Classification of elementary particles- Mass spectra and decays of elementary particles- Quantum Numbers- Conservation Laws.	12	Chalk & Talk	<i>S. Parinigh</i>

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**LESSON PLAN**  
**2023-2024**

Class : III B.Sc Physics  
 Sub. Code : 21P52


Title of the Paper: : Programming with C

Semester : V

Total Hours : 60 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Unit-I Overview of C</b> History of C - Importance of C - Sample C. Programs - Basic structure of C Programs - programming style - executing a C Program. <b>Constants, Variables and Data Types</b> Introduction - Character set - C Tokens - Keywords and Identifiers - Constants - Variables- Data Types - Defining symbolic constants. <b>Programs:</b> Adding two numbers - Interest Calculation-Multiplication of two numbers.	12	Chalk & Talk	E. Chack Monica MA
July	II	<b>Unit-II Operators and expression</b> Introduction - Arithmetic of operators - Relational operators - Logical operators - assignment operators - increment and decrement operators. Conditional operator - Bitwise operators - special operators - arithmetic expressions - evaluation of expressions precedence of arithmetic operators - some computational problems - Type conversions in expressions - operators' precedence and associatively - Mathematical Functions. <b>Program:</b> covert a given numbers of days into months and days- sequence of squares of numbers.	12	Chalk & Talk	E. Chack Monica
August	III	<b>UNIT-III Managng Input and output operations</b> Introduction - Reading a Character - Writing a Character - Formatted input - Formatted output. <b>Decision making, branching and looping</b> Introduction - Decision making with if statement - simple if statement - The if ... else statement - Nesting of if ... else statements - The switch statement - The ? : operator - The goto Statement - The while statement - The do Statement - The for statement - Jumps in Loops. <b>Program:</b> Test the Character type using if...else(Problem 5.2), Use of if for counting(Problem 6.2), Selecting the largest of three numbers(Problem 6.4), to read and print name of the months(Problem 6.6), print all prime numbers between 1 and n (Problem 7.5).	12	Chalk & Talk	MA
Septem er	IV	<b>Unit-IV Array</b> Introduction-one dimensional Arrays-declaration of one dimensional arrays - initialization of one dimensional arrays- two dimensional arrays- initialization of two dimensional arrays- Multi-Dimensional Arrays - Dynamic Arrays. <b>Program:</b> two's compliment of a binary number (Problem 8.3), Transpose of a matrix (Problem 8.7), N X N matrix multiplication (Problem 8.8).	12	Chalk & Talk	MA
October	V	<b>Unit-V User - define Functions</b> Introduction - definition of functions - return values and their types - Function Call - Function Declaration - Category of Functions - No Arguments and no return values - Arguments but No Return Values - Arguments with return values - No Arguments but returns values- Nesting of Functions - Recursion <b>Program:</b> Interest calculation programs (Problem 10.1, 10.2, 10.3)	12	Chalk & Talk	E. Chack Monica

  
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**LESSON PLAN**  
**2023-2024**

Class : III B.Sc Physics  
 Sub. Code : 21PE5A  
 Title of the Paper: Electronics

Semester : V

Total Hours : 60 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Diode Circuits and Transistor fundamentals</b> The Half Wave Rectifier-The Full Wave Rectifier-The Bridge Rectifier-The Choke Input Filter-The Capacitor Input Filter-Clippers and Limiters-Clampers-The Zener Diode-The Loaded Zener Regulator.	12	Chalk & Talk	P.R.L.
July	II	<b>Power Amplifiers and FETs</b> Darlington connections- Amplifier terms-Two load lines-Class A operation-Class B operation -FETs Basic ideas-Drain curves-The Transconductance curve-Biasing in the Ohmic region-Biasing in the active region-Transconductance-The Depletion mode MOSFET.	12	Chalk & Talk	<i>[Signature]</i>
August	III	<b>Operational Amplifiers and Oscillators</b> Introduction to Op Amps-The 741 Op Amp-The Inverting Amplifier-The Non Inverting Amplifiers-Theory of Sinusoidal Oscillation-The Wein's bridge Oscillator-The Colpitt's Oscillator-The 555 timer-Astable operation of the 555 Timer.	12	Chalk & Talk	P.R.L.
September	IV	<b>Digital Sequential Circuits</b> Introduction-RS flip flops-Gated flip flop- D flip flop -JK flip flop-JK master slave flip flop -Types of Shift registers-Serial in Serial out-Serial in Parallel out.	12	Chalk & Talk	<i>[Signature]</i>
October	V	<b>Counters and converters</b> Asynchronous counters-Synchronous counters- Decade counter-Variable resistor networks-Binary ladders- D/A converters-A/D converters.	12	Chalk & Talk	P.R.L. <i>[Signature]</i>

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**LESSON PLAN**  
**2023-2024**

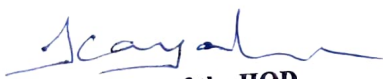
Class : III B.Sc Physics  
Sub. Code : 21SEP51

Semester : V

Title of the Paper: Fibre Optic Communication

Total Hours : 30 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Introduction to fibre optic communication:</b> Introduction – Advantages of optical fibre communication-Types of optical fibres- Numerical Aperture of optical fibre- Fibre bundles and cables- Fibre strength- Fibre optical properties.	6	Chalk & Talk	P. RL.
July	II	<b>Fibre optical source devices:</b> Types of optical sources- operation principle in LED and Laser- External Quantum Efficiency of LED- LED modulation Bandwidth- Coupling of LEDs with fibre – Edge Emitting LEDs.	6	Chalk & Talk	P. RL.
August	III	<b>Fibre optical communication components:</b> Introduction- Coupling components for optical Fibres- Modulation methods and modulators- switches- Transmitters- receivers- Optical amplifiers.	6	Chalk & Talk	P. RL.
September	IV	<b>Fibre optical communication systems:</b> Elementary fibre optic communication systems- Wavelength division multiplexing- optical Time Division multiplexing- Data buses.	6	Chalk & Talk	P. RL.
October	V	<b>Fibre optical networks:</b> Local Area network system- FDDI- SONET and SDH Networks- ISDN, BISDN and High speed Networks- Microwave technology Applications of Light wave systems.	6	Chalk & Talk	P. RL.

  
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**LESSON PLAN**  
**2023-2024**

Class : III B.Sc Physics  
 Sub. Code : 214EV5

Title of the Paper: Environmental Studies

Semester : V

Total Hours : 30 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	Natural Resources :- Water Renewable Resources and watershed management- Forest Resources, management and conservation - Soil Resources and conservation- Food Resources - Energy Resources - Non Renewable Resources and conservation of energy.	6	Chalk & Talk	P. R. L.
July	II	Ecosystem :- Structure of an Ecosystem, Abiotic Components - Biotic Components - Functional Components - Food Chain - Energy Flow - Biogeochemical Cycles - Types of Ecosystem - Types of Aquatic Ecosystem - Pond Ecosystem - Grassland Ecosystem - Desert Ecosystem.	6	Chalk & Talk	S. Jeyaraj
August	III	Biodiversity and Conservation: - What is Biodiversity - Levels of Biodiversity - Values of Biodiversity - Consumptive use value - Social benefits - Cultural Values - India as a Mega Diversity Nation - Methods of Conservation (Zoological Parks, National Parks and Sanctuaries) and its significance.	6	Chalk & Talk	P. R. L.
September	IV	Pollution : - Types of Pollutants - Types of Pollution - Air Pollution - Water Pollution- Thermal Pollution - Marine Pollution - Soil Pollution, Noise Pollution - Radiation Pollution. Solid waste and consumerism, effects of soil pollution, solid waste management - Control Measures.	6	Chalk & Talk	S. Jeyaraj
October	V	Environmental Ethics and Social Issues :- Attitudes of Major Religions towards the Environment - Human Population and Environment - Globalization and the Environment - Global Environmental Issues - Information technology and the environment, Alternative Lifestyles - Role of Individuals, Organizations and Government in protecting the Environment.	6	Chalk & Talk	P. R. L. S. Jeyaraj

  
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**LESSON PLAN**  
**2022-2023**

Class : I B.Sc Maths  
 Sub. Code : 23OUMAGEPH1  
 Title of the Paper: Allied Physics - I

Semester : I  
 Total Hours : 60 Hours

Month	Unit	Description of the Syllabus	Semester : I		
			Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>WAVES, OSCILLATIONS AND ULTRASONICS:</b> simple harmonic motion (SHM) - composition of two SHMs at right angles (periods in the ratio 1:1) - Lissajous figures - uses - laws of transverse vibrations of strings - determination of AC frequency using sonometer (steel and brass wires) - ultrasound - production - piezoelectric method - application of ultrasonics: medical field - lithotripsy, ultrasonography - ultrasonoimaging - ultrasonics in dentistry - physiotherapy, ophthalmology - advantages of noninvasive surgery - ultrasonics in green chemistry.	12	Chalk & Talk	S. Manoj
July	II	<b>PROPERTIES OF MATTER: Elasticity:</b> elastic constants - bending of beam - theory of non-uniform bending - determination of Young's modulus by non-uniform bending - energy stored in a stretched wire - torsion of a wire - determination of rigidity modulus by torsional pendulum. <b>Viscosity:</b> streamline and turbulent motion - critical velocity - coefficient of viscosity - Poiseuille's formula - comparison of viscosities - burette method. <b>Surface tension:</b> definition - molecular theory - droplets formation - shape, size and lifetime - COVID transmission through droplets, saliva-drop weight method - interfacial surface tension.	12	Chalk & Talk	S. Manoj
August	III	<b>HEAT AND THERMODYNAMICS:</b> Joule-Kelvin effect - Joule-Thomson porous plug experiment - theory - temperature of inversion - liquefaction of Oxygen - Linde's process of liquefaction of air - liquid Oxygen for medical purpose - importance of cryocoolers - thermodynamic system - thermodynamic equilibrium - laws of thermodynamics - heat engine - Carnot's cycle - efficiency - entropy change of entropy in reversible and irreversible process.	12	Chalk & Talk	S. Manoj
September	IV	<b>ELECTRICITY AND MAGNETISM:</b> potentiometer - principle - measurement of thermo emf using potentiometer - magnetic field due to a current carrying conductor - Biot-Savart's law - field along the axis of the coil carrying current - peak, average and RMS values of ac current and voltage - power factor and current values in an AC circuit - types of switches in household and factories - Smart wifi switches-fuses and circuit breakers in houses	12	Chalk & Talk	S. Manoj
October	V	<b>DIGITAL ELECTRONICS AND DIGITAL INDIA:</b> logic gates, OR, AND, NOT, NAND, NOR, EXOR logic gates - universal building blocks - Boolean algebra - De Morgan's theorem - verification - overview of Government initiatives: software technological parks under MeitY, NIELIT- semiconductor laboratories under Dept. of Space - an introduction to Digital India	12	Chalk & Talk	S. Manoj

  
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**Class : II B.Sc Maths**  
**Sub. Code : 22OUMAGEPII3**

**LESSON PLAN**  
**2022-2023**

**Title of the Paper: Electricity and Electronics**

**Semester : III**  
**Total Hours : 60 Hours**

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Current Resistance and Electrical Measurements</b> Current and current density-Expression for current density- Equation of continuity-Ohm's law and electrical conductivity-Kirchhoff's laws-Application of Kirchhoff's laws to Whetstone's network-Sensitivity of Whetstone's bridge-Carey foster bridge-Potentiometer-Calibration of Ammeter-Calibration of voltmeter-Measurement of low resistance kelvin double bridge method-capacitance of capacitor(Kelvin's Null method)	12	Chalk & Talk	E. Chris Monica
July	II	<b>Thermo-Electricity</b> Seebeck effect- Laws of thermo e.m.f- Measurement of thermo-EMF using potentiometer- Peltier effect- Thomson effect-Thermodynamics of Thermocouple-Thermo electric diagrams-Uses of Thermoelectric Diagrams.	12	Chalk & Talk	E. Chris Monica
August	III	<b>Semiconductor Physics</b> Semiconductor-Intrinsic semiconductor-Extrinsic semiconductor-n type semiconductor-p type semiconductor- pn junction-properties of pn junction-Applying D.C.Voltage Across pn Junction or Biasing a pn Junction-Current flow in a forward biased pn junction-Volt ampere characteristics of pn junction.	12	Chalk & Talk	Sathy
September	IV	<b>Transistor</b> Transistor- Transistor action- Transistor as an amplifier- Transistor connections- Common base connection- characteristics of Common base connection -Common emitter connection- characteristics of Common emitter connection -Common collector connection	12	Chalk & Talk	Sathy
October	V	<b>Logic gates</b> Decimal to binary conversion-Binary to decimal conversion- Octal number system-Hexadecimal number system- OR gate- AND gate-NOT gate-Combination of basic logic gates- NAND Gate as a universal Gate- Boolean theorems- DeMorgans theorems	12	Chalk & Talk	E. Chris Monica

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**LESSON PLAN**

2022-2023

Class : II B.Sc Chemistry  
 Sub. Code : 22OUCHGEPI13

Title of the Paper: Mechanics and Properties of Matter

Semester : III  
 Total Hours : 60 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Force, Power and Energy:</b> The basic Forces in nature- Central forces - Conservative forces-Non conservative forces-Friction-Limiting friction, Co efficient of friction and Angle of friction-Laws of friction-Experiment to determine the coefficient of friction-Energy-Kinetic energy- Potential energy- Power.	12	Chalk & Talk	<i>[Signature]</i>
July	II	<b>Rotational Motion:</b> Angular velocity-Angular acceleration- Centripetal force - Centrifugal force- Torque -Angular momentum-Expression for torque in rotational motion- Expression for angular momentum of a rotating rigid body - Moment of inertia -Perpendicular axes theorem -Theorem of parallel axes-Moment of Inertia of circular disc, Solid sphere	12	Chalk & Talk	<i>[Signature]</i>
August	III	<b>Gravitational motion:</b> Kepler's law of planetary motion - Newton's law of gravitation-Mass and Density of the Earth-Determination of G-Boy's method - The compound pendulum-Determination of g with compound pendulum-Variation of g with latitude ,altitude and depth- artificial satellites.	12	Chalk & Talk	<i>[Signature]</i>
September	IV	<b>Elasticity:</b> Different moduli of Elasticity-Poisson's ratio-Bending of beams -expressions for the bending moment-Depression of the loaded end of a cantilever-Determination of Young's modulus by uniform and non uniform bending - Torsion of a cylinder -Torsional oscillations of a body-Rigidity modulus by Torsion pendulum.	12	Chalk & Talk	<i>[Signature]</i>
October	V	<b>Viscosity:</b> Introduction - Derivation of Poiseuille's formula -Poiseuille's method for determining coefficient of viscosity of a liquid - Equation of continuity- Bernoulli's Theorem- Applications of Bernoulli's theorem -Venturimeter -Pitot Tube.	12	Chalk & Talk	<i>[Signature]</i>

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**LESSON PLAN**  
**2022-2023**

Class : III B.Sc Chemistry

Sub. Code : 21AP3

Title of the Paper: Electricity and Electronics

Semester : V

Total Hours : 60 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Current , Resistance and Electrical Measurements</b> Current and current density-Expression for current density- Equation of continuity-Ohm's law and electrical conductivity-Kirchhoff's laws-Application of Kirchhoff's laws to Whetstone's network-Sensitivity of Whetstone's bridge-Carey foster bridge-Potentiometer	12	Chalk & Talk	E. Chris Monica
July	II	<b>Thermo-Electricity</b> Seebeck effect- Laws of thermo e.m.f- Measurement of thermo-EMF using potentiometer- Peltier effect- Thomson effect-Thermodynamics of Thermocouple-Thermo electric diagrams	12	Chalk & Talk	E. Chris Monica
August	III	<b>Semiconductor Physics</b> Semiconductor-Intrinsic semiconductor-Extrinsic semiconductor-n type semiconductor-p type semiconductor-pn junction-properties of pn junction-Applying D.C. Voltage Across pn Junction or Biasing a pn Junction-Current flow in a forward biased pn junction-Volt ampere characteristics of pn junction.	12	Chalk & Talk	S. Jay
September	IV	<b>Transistor</b> Transistor- Transistor action- Transistor symbols - Transistor connections- Common base connection- characteristics of Common base connection -Common emitter connection- characteristics of Common emitter connection -Common collector connection- Transistor load line analysis.	12	Chalk & Talk	S. Jay
October	V	<b>Logic gates</b> Decimal to binary conversion-Binary to decimal conversion- Logic gates-three basic logic gates-OR gate-AND gate-NOT gate-Combination of basic logic gates- NAND Gate as a universal Gate- Boolean theorems- DeMorgans theorems	12	Chalk & Talk	E. Chris Monica

  
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**LESSON PLAN**  
**2023-2024**

Class : II M.Sc Physics  
 Sub. Code : 22OPPH31  
 Title of the Paper: Solid State Physics I

Semester : III  
 Total Hours : 90 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Crystal Structure</b> Periodic Array of atoms- Primitive lattice cell - Fundamental types of lattice – Two and Three dimensional lattice types - Index system for crystal planes-Simple crystal structures :NaCl,CsCl,hcp,Diamond and cubic zinc sulfide structure. <b>Wave diffraction and Reciprocal lattice</b> Diffraction of waves by crystals– Scattered wave amplitude – Brillouin Zones- Reciprocal lattices to sc, bcc and fcc lattices.	18	Chalk & Talk	P. R. L. E. Chitra Monica
July	II	<b>Crystal binding and elastic constants</b> Crystals of Inert gas– Vander Waals – London Interaction - Ionic crystals – Electrostatic or Madelung Energy-Evaluation of the Madelung constant - Covalent crystals – Metals- Hydrogen bonds – Atomic radii – Analysis of elastic strains – Elastic compliance and stiffness constants.	18	Chalk & Talk	E. Chitra Monica
August	III	<b>Phonons I –Crystal vibrations</b> Vibrations of crystals with monoatomic basis- Two atoms per primitive basis– Quantization of elastic waves – Phonon momentum- Inelastic scattering by phonons. <b>Phonons II-Thermal Properties</b> Phonon heat capacity - Planck distribution –Density of states in one and three dimension- Debye model for density of states –Debye T <sup>3</sup> law- Einstein model of the Density of states.	18	Chalk & Talk	P. R. L.
September	IV	<b>Free electron Fermi gas</b> Energy levels in one dimension-Effect of temperature on the Fermi- Dirac distribution -Free electron gas in three dimensions-Heat capacity of the electron gas- Electrical conductivity and Ohm's law – Motion in magnetic fields – Thermal conductivity of metals. <b>Energy bands</b> Nearly free electron model -Bloch functions- Kronig Penny model- Wave equation of electron in a periodic potential.	18	Chalk & Talk	E. Chitra Monica
October	V	<b>Semiconductor crystals</b> Band gap in semiconductors- Equations of motion- Holes – Effective mass - Effective mass in semiconductors - Intrinsic carrier concentration-Impurity conductivity <b>Fermi surfaces and metals</b> Reduced zone scheme – periodic zone scheme-Construction of Fermi surfaces- Nearly free electrons - Electron orbits, hole orbits, and open orbits-Calculation of energy bands- Experimental methods in Fermi surface studies- Quantization of orbits in a magnetic field.	18	Chalk & Talk	P. R. L.

  
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**LESSON PLAN**  
**2023-2024**

Class : II M.Sc Physics  
 Sub. Code : 22OPPH32

Title of the Paper: Quantum mechanics I

Semester : III  
 Total Hours : 90 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>The Schrodinger Wave Equation</b> The Old Quantum Theory -Uncertainty and Complementarity -Development of the Wave equation - Interpretation of the Wave Function- Postulates in Quantum mechanics and its interpretation- Ehrenfest's theorem- Orthonormality of energy eigen functions - The closure property- Probability function and expectation value- General solution of the Schrodinger equation- Box Normalization- One-dimensional square well Potential.	18	Chalk & Talk	
July	II	<b>Matrix Formulation of Quantum Mechanics</b> Matrix Algebra - Types of matrices - Hermitian and unitary matrices - Hilbert space - Dirac's bra and ket notation - Physical meaning of matrix elements - Equation of motions - Schrodinger picture - Heisenberg picture - Interaction picture - Classical Lagrangian and Hamiltonian equations of motion - Poisson brackets and commutator brackets.	18	Chalk & Talk	
August	III	<b>Discrete Eigen values: Bound States</b> Linear Harmonic Oscillator- Asymptotic behavior- Energy levels- zero-point energy- Hermite polynomials- Harmonic Oscillator wave functions- The Hydrogen Atom- Reduced mass- Asymptotic behavior- Energy levels- Laguerre Polynomials- Hydrogen atom wave function- Degeneracy.	18	Chalk & Talk	
September	IV	<b>Symmetry in Quantum mechanics and Angular Momentum states</b> Space Displacements - Unitary displacement - Equation of Motion - Symmetry and degeneracy - Time displacement - Commutation Relation of the Generators - Choice of a Representation - Angular Momentum and unitary groups - Combination of Angular momentum states - Eigen values of the total angular momentum - Clebsch-Gordan Coefficients. ( $J=1/2$ ).	18	Chalk & Talk	
October	V	Born approximation - Validity of Born approximation - Scattering from two potential - Distorted wave born approximation - Partial wave analysis of the DWBA - Scattering Amplitude and cross section.	18	Chalk & Talk	

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**LESSON PLAN**  
**2023-2024**

Class : II M.Sc Physics  
 Sub. Code : 22OPPH33  
 Title of the Paper: Nuclear physics

Semester : III  
 Total Hours : 75 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Nucleus</b> Introduction- Rutherford scattering and Estimation of the nuclear size- Measurement of nuclear radius – Nuclear spin- Moment and statistics. <b>The Q Equation</b> Introduction- Types of nuclear reactions- The balance of mass and energy in nuclear reaction – The Q equation- Solution of the Q equation	15	Chalk & Talk	M.A. [Signature]
July	II	<b>Radioactivity</b> <b>Alpha rays</b> Range of $\alpha$ -particles- Disintegration energy of spontaneous $\alpha$ -Decay- Alpha decay paradox- Barrier penetration. <b>Beta rays</b> Introduction to continuous $\beta$ -ray spectrum- Difficulties encountered to understand it -Pauli's Neutrino hypothesis- Fermi's theory of $\beta$ decay-The detection of Neutrino. <b>Gamma rays</b> Introduction - $\gamma$ ray emission -Selection rules- Internal conversion.	15	Chalk & Talk	M.A. [Signature]
August	III	<b>Nuclear models</b> Binding energy- Semi empirical mass formula- Liquid drop model- Nuclear cross section -Partial wave analysis- Nuclear transmutation - compound nucleus theory.	15	Chalk & Talk	S. Parvathi [Signature]
September	IV	<b>Nuclear Fission and Fusion</b> Types of fission – Distribution of fission products – Neutron emission in fission – fissile and fertile materials, spontaneous fission – Deformation of liquid drop: Bohr and Wheeler's theory – Quantum effects- Nuclear fusion and Thermo nuclear Reaction – Controlled Thermo nuclear reactions (Hydrogen bomb, Different methods for the production of fusion reactions). <b>Nuclear fission reactors</b> Nuclear chain reaction (Four Factor Formula) – The Critical size of a Reactor (Reactor buckling on leakage factors, Effect of Reflectors).	15	Chalk & Talk	M.A. [Signature]
October	V	<b>Elementary particles</b> Introduction- Classification of Elementary particles- Fundamental interactions- conservation laws-conservation of linear momentum, conservation of angular momentum, conservation of energy, conservation of charge, conservation of lepton number, conservation of baryon number- Hypernuclei- Quarks.	15	Chalk & Talk	S. Parvathi [Signature]

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**LESSON PLAN**  
**2022-2023**

Class : II MSc.,Physics  
Sub. Code : 22OPPHDSE3A  
Title of the Paper: Nano Physics

Semester : III  
Total Hours : 75 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Introduction to Physics of the Solid State</b> Introduction-Size dependence of properties – Crystal Structures – Face-Centered Cubic Nanoparticles – Lattice Vibrations – <b>Energy Band:</b> Insulators, Semiconductors and Conductors – Reciprocal Space – Effective Masses – Fermi Surfaces –Donors, Acceptors and Deep Traps – Mobility – Excitons.	15	Chalk & Talk	
July	II	<b>Nano particles and methods of measuring properties</b> Introduction - Particle size determination – Transmission Electron Microscopy- Scanning Microscopy- Infrared and Raman Spectroscopy –Optical Properties- Photo fragmentation- Coulombic Explosion- RF plasma- Thermolysis- Pulsed Laser methods.	15	Chalk & Talk	
August	III	<b>Nano Structures</b> Carbon clusters-Small Carbon Clusters-Discovery of C <sub>60</sub> -Carbon nanotubes -Fabrication-Electrical Properties-Vibrational Properties – Mechanical Properties- Porous silicon- Photonic crystals- Dynamics of Nanomagnets- Gaint and colossal Magnetoresistance.	15	Chalk & Talk	
September	IV	<b>Quantum Wells, Wires and Dots</b> Introduction -Preparation of quantum Nanostructure- Size and dimensionality effects-Size Effect-Excitons- Single Electron Tunneling- Applications-Infrared Detectors-Quantum Dot Lasers.	15	Chalk & Talk	
October	V	<b>Polymers and Nanostructure</b> Introduction –Polymerization-Sizes of Polymers-Conductive Polymers- Block Copolymers- Micelles-Polypeptide Nanowire and protein Nanoparticles. <b>Nanomachines and nanodevices</b> Micro electro mechanical Systems (MEMSs)- Nano electromechanical Systems (NEMSs) - Molecular and supramolecular switches.	15	Chalk & Talk	

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