

# **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+ & CGPA 3.51 by NAAC**



## **LESSON PLAN 2021-2022**

**DEPARTMENT OF PHYSICS  
(UG & PG – Odd & Even Semester)**



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**LESSON PLAN**  
2021-2022

Class: I Physics

Semester: I

Sub. Code: 21P11

Title of the Paper: Mechanics properties of matter and sound

Total Hours: 60

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Mechanics:</b> Significance of Conservation laws-Concepts of work, power and energy-Conservative forces-Energy-Conservation of linear momentum-Collision—Calculation of final velocities of colliding particles(one dimension only)-Systems of variable mass-The Rocket.	12	Online mode	 K.Divya
July	II	<b>Dynamics of Rigid Bodies :</b> Rigid body -Torque-Angular momentum-Moment of inertia(Radius of Gyration)-General theorems on moment of inertia-Particular cases of moment of inertia(circular disc, circular ring, solid cylinder, solid sphere, hollow sphere).	12	Online mode	 K.Divya
August	III	<b>Gravitation:</b> Newton's law of gravitation-Experimental determination of gravitational constant (G) using Boy's method- Kepler's laws -Compound pendulum( to find value of g and T using bar pendulum) <b>Viscosity-</b> Viscosity- Newton's law of viscous flow-Coefficient of viscosity- Equation of continuity of flow-Bernoulli's theorem - Applications of Bernoulli's theorem (Venturimeter, Pitot tube).	12	Online mode	 K.Divya
September	IV	<b>Elasticity:</b> Introduction- Load, Stress and strain - Hooke's law -Different types of Elasticity - Poisson's ratio-Relations connecting the elastic constants - Determination of Young's modulus for a material(for a thick Bar) -Bending moment - Determination of Elastic constant (Searle's method).	12	Online mode	 K.Divya
October	V	<b>Sound :</b> Simple harmonic motion - Linearity and superposition principle -Wave motion -Characteristics of wave motion-Transverse wave motion- Longitudinal wave motion-Definitions-Relation between frequency and wavelength-Properties of longitudinal progressive wave-Stationary waves-Properties of stationary longitudinal waves- Melde's experiment -Acoustics-Reverberation-Factors affecting the Acoustics of buildings-Requisite for Good Acoustics.	12	Online mode	 K.Divya

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**LESSON PLAN**  
2021-2022

Class: I Physics

Semester: I

Sub. Code: 21SEP11

Title of the Paper: Basic Electronics

Total Hours: 30

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Resistors:</b> Resistors – Resistor types –Wire wound resistors- Carbon composition resistors – Carbon film resistors – Cermet film resistors – Metal film resistors – Power rating – value tolerance – Variable resistors– Potentiometers and rheostats – Resistor colour code – Resistance colour bands.	6	Online mode	 M.Preethi
July	II	<b>Inductor:</b> Inductor-Comparison of different cores – Inductance of an inductor – Another definition of inductance –Mutual inductance – Coefficient of coupling – Variable inductors – Inductors in series or parallel without M – Series combination with M.	6	Online mode	 M.Preethi
August	III	<b>Capacitors:</b> Capacitors – Capacitor connected to a battery – Capacitance – Factors controlling capacitance – Types of capacitors – Fixed capacitors – Variable capacitors.	6	Online mode	 M.Preethi R.Ariya Nachiyar 
September	IV	<b>Transistor:</b> Bipolar Junction Transistor- Transistor Biasing-Important biasing Rule-Transistor Circuit Configuration-CB, CE, CC Configurations and Characteristics- Relation between Transistor Currents- Leakage Currents in a Transistor-Thermal Runway.	6	Online mode	 R.Ariya Nachiyar
October	V	<b>Semiconductor and Types of Semiconductors:</b> Semiconductor – Bonds in semiconductor – Crystals – Commonly used semiconductor – Energy band description of semiconductors – Effect of temperature on semiconductors -Intrinsic semiconductor – extrinsic semiconductor – N type – P type semiconductors.	6	Online mode	 R.Ariya Nachiyar

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**LESSON PLAN**  
**2021-2022**

Class: I Physics

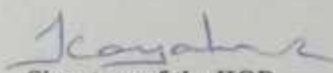
Semester: I

Sub. Code: 21SEP12

Title of the Paper: Digital Electronics

Total Hours: 30

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Binary number system:</b> Number System – Conversion of decimal number into binary number – Binary to decimal conversion – Binary addition – Binary subtraction – 1's and 2's complement method – Binary multiplication and division – Hexadecimal numbers.	6	Online mode	E. Chris Monica
July	II	<b>Logic gates:</b> Basic logic gates AND gate –OR gate –NOT gate– Characteristics of logic gates –NOR gate- NAND gate –Exclusive OR gate- Logic gate families- TTL NAND gate- TTL NOR gate.	6	Online mode	E. Chris Monica
August	III	<b>Demorgan's laws and applications:</b> Boolean equation of logic circuits – Standard forms for expressing logic functions – Sum of products form- Products-of -sums form-Boolean algebra – Demorgan's laws The NAND gate and NOR gate as universal building block, different expressions for X-OR gate.	6	Online mode	E. Chris Monica
September	IV	<b>Karnaugh Map:</b> Two variable map-Three variable map- Four variable map- Minterm- Maxterm-Truth table from the karnaugh map-Don't care conditions- Product-of-sums simplification	6	Online mode	E. Chris Monica
October	V	Binary adder: Half adder – full adder- Half subtractor-Full subtractor-Multiplexer- Demultiplexer-Encoder –Decimal toBCD encoder – Decoders - BCD-to-decimal decoder-BCD to seven segment decoder.	6	Online mode	E. Chris Monica

  
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**LESSON PLAN**  
2021-2022

Class: I Physics

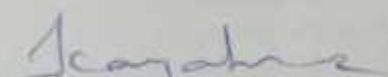
Semester: I

Sub. Code: 21NMP1

Title of the Paper: Energy Physics

Total Hours: 30

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Fundamentals of Energy Science:</b> Introduction-Energy, Economy and social development - Classification of Energy Resources-Importance of Non-Conventional energy sources-Advantages and Disadvantages of conventional energy sources-Environmental aspects of energy.	6	Online mode	S. Priyanka
July	II	<b>SolarEnergy:</b> Introduction-solar collectors-solar water heater-solar industrial Heating System-Solar refrigeration and air conditioning system-Solar cookers.	6	Online mode	E. Chirs Monica
August	III	<b>WindEnergy:</b> Introduction-Origin of winds-Nature of winds-Wind turbine sitting-Major application of wind power-Environmental aspects- Wind energy programme in India.	6	Online mode	S. Priyanka
September	IV	<b>BiomassEnergy:</b> Introduction- Photosynthesis process -Biomass Resources-Biomass conversion Technologies- Biogas production from waste biomass.	6	Online mode	E. Chirs Monica
October	V	<b>OceanEnergy:</b> Introduction-Tidal Energy- Origin and Nature of Tidal Energy -Limitations of Tidal energy-Wave Energy- Power in Waves- Ocean thermal Energy- Ocean thermal Energy Conversion Technology.	6	Online mode	S. Priyanka E. Chirs Monica E. Chirs Monica

  
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## LESSON PLAN

2021-2022




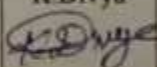


Class: II Physics

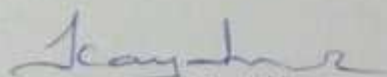
Semester: III

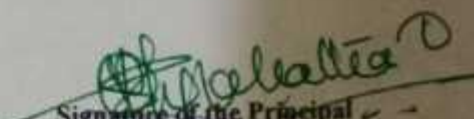
Sub. Code: 17P31

Title of the Paper: Electromagnetism

Total Hours: 60

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Static Electric Field</b> Maxwell's equation and their empirical basis-Introduction-Properties of charge- Conservation of charges- Quantisation of charge: Fundamental of charges-Coulomb's law -Definition of S.I unit of charge: coulomb-Comparison of electrical force withgravitational force-Principle of superposition-Electrostatic force due to a continuous distribution of charge-Electric field strength-Concept of electric field in terms of lines of force-Properties of electric lines of force.	12	Online mode	 S. Ameer Nisha Bibi
July	II	<b>StaticMagneticField</b> Introduction-Force on a moving charge in a uniform magnetic field- Lorentz force- Torque on a current loop-Moving coil ballistic galvanometer- Biot savart law-Relation between $\mu_0$ and $\epsilon_0$ -Magnetic field due to a current carrying straight wire- Force between current carrying parallel wires-Magnetic field induction on the axis of a current carrying circular loop.	12	Online mode	 S. Ameer Nisha Bibi
August	III	<b>Magnetic Properties of Materials</b> Flux density in a magnetic material-Intensity of magnetization, Relative permeability andmagnetic susceptibility-Diamagnetic, paramagnetic and ferromagnetic substance- Hysteresis and B-H curve(concept only)-Langevin's theory of diamagnetism-Langevin's theory of paramagnetism-Weiss' theory of ferromagnetism.	12	Online mode	 S. Ameer Nisha Bibi K. Divya 
September	IV	<b>Electromagnetic Inductions</b> Faraday's law of electromagnetic induction-Faraday's laws in universal form-Self induction -Self inductance of a solenoid - Self inductance of a toroidal solenoid- Measurement of self inductance by Rayleigh's method-Mutual inductance-Reciprocity theorem of mutual inductances-Mutual inductance of solenoid coil system- Measurement of mutual inductance.	12	Online mode	 K. Divya
October	V	<b>Transient Currents</b> RC circuit-Measurement of high resistance by the method of leakage-Transients inseries LCR circuit-Maxwell's bridge for self inductance-Anderson's bridge for self inductance-Owen's bridge for self inductance-De Sauty's bridge for capacitance-Wein's bridge for capacitance.	12	Online mode	 K. Divya

  
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**LESSON PLAN**  
2021-2022

Class: III Physics

Semester: V

Sub. Code: 17P51

Title of the Paper: Atomic & Nuclear physics

Total Hours: 30

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-Resonance Excitation and Ionization potential.	6	Online mode	 S. Ameer Nisha Bibi
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 quantisation- 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.	6	Online mode	 S. Priyanka
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.	6	Online mode	 S. Ameer Nisha Bibi
September	IV	<b>Particle Accelerators&amp; Radiation Detectors</b> Introduction- Cockcroft and Walton Accelerator-Wave -Guide Accelerator- Betatron- Synchrocyclotrons- Synchrotrons- Ionization Chamber- Scintillation Detectors- Cloud Chamber- Bubble Chamber - Spark Chamber-Nuclear Emulsions	6	Online mode	 S. Priyanka
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-Weak decays of Strange particles- Particle Symmetries-Quarks.	6	Online mode	 S. Ameer Nisha Bibi  S. Priyanka

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**LESSON PLAN**  
**2021-2022**

Class: III Physics

Semester: V

Sub. Code: 17P52

Title of the Paper: Programming with C++

Total Hours: 60

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Principles of Oop, Tokens, Expressions and Control Structures</b> Introduction to object Programming – Procedural VS object Oriented – Basic concepts – benefits – Languages – Applications – structure – Character set Basic data type – Identifier – operators – Control Structure	12	Online mode	 M.Preethi K.Divya 
July	II	<b>Functions and Classes</b> Function – declarations – parameter passing methods – inline functions – Default arguments – functions – Overloading – friend and virtual functions- Structure class – Defining member function in class - arrays within a class	12	Online mode	 M.Preethi
August	III	<b>Constructors and Destructors, Operator Overloading</b> Constructors– constructor overloading- dynamic Constructor–destructors-operator overloading- unary, binary operators-overloading using friend functions-Rules for over loading –type conversion.	12	Online mode	K.Divya 
September	IV	<b>Inheritance, Pointers</b> Inheritance – Various forms of Inheritance – abstract classes – pointers – pointers to objects – this pointer – virtual functions-virtual constructors and destructors	12	Online mode	 M.Preethi
October	V	<b>Managing console I/O Operations, Files</b> I/O stream-stream class-formatted and unformatted I/O manipulators-file of classes-file I/O- updating file, error handling and command line arguments	12	Online mode	 K.Divya

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**LESSON PLAN**  
2021-2022

Class: III PHYSICS

Semester: V

Sub. Code: 17PE5A

Title of the Paper: Electronics

Total Hours: 60

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 Transformer-The full Wave Rectifier-The Bridge Rectifier-The Choke Input Filter-The Capacitor input Filter-Clipppers and Limiters-Clampers-The Zener diode-The loaded Zener regulator-Variations in Current Gain -The load line-The operating point-The Transistor switch-Emitter bias	12	Online mode	 R. Ariya Nachiyar
July	II	<b>Power Amplifiers and FETs</b> Amplifier terms-Two load lines-Class A operation-Class B operation-Class C operation-Darlington connections-FETs Basic ideas-Drain curves-The Transconductance curve-Biasing in the Ohmic region-Biasing in the active region-Transconductance-The Depletion mode MOSFET-The Enhancement mode MOSFET-The ohmic region	12	Online mode	 R. Ariya Nachiyar
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 bridge Oscillator-The Colpitts Oscillator-The 555 timer-Astable operation of the timer.	12	Online mode	 R. Ariya Nachiyar
September	IV	<b>Digital Sequential Circuits</b> Introduction-RS flip flops-Clocked RS flip flop -JK flip flop-JK master slave flip flop-D flip flop-Types of Shift registers-Serial in Serial out-Serial in Parallel out-Parallel in Serial out-Parallel in Parallel out.	12	Online mode	 R. Ariya Nachiyar
October	V	<b>Counters and converters</b> Asynchronous counters- 3 Bit up and down counters-Synchronous counters-Decade counter-Variable resistor networks-Binary ladders-D/A converters-A/D converters.	12	Online mode	 R. Ariya Nachiyar

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LESSON PLAN

2021-2022

Class: III PHYSICS

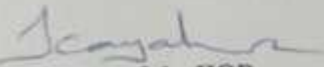
Semester: V

Sub. Code: 17SEP51

Title of the Paper: Fibre Optic communication

Total Hours: 30

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Principles of fibre optic communication:</b> Introduction and historical background - Advantages of optical fibre communication- Elementary fibre optic communication systems- types of optical fibres- Numerical Aperture of optical fibre- Fibre bundles and cables- Fibre strength- Fibre optical properties.	6	Online mode	S. Priyanka K. Divya
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 LED's with fibre - Edge Emitting LED's	6	Online mode	S. Priyanka
August	III	<b>Fibre optical communication components:</b> Introduction- coupling components for optical Fibres- Modulation methods and modulators- switches- Transmitters- receivers- Optical amplifiers	6	Online mode	S. Priyanka
September	IV	<b>Fibre optical communication systems:</b> Wavelength division multiplexing- optical Time Division multiplexing- Data buses.	6	Online mode	K. Divya
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	Online mode	K. Divya

  
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**LESSON PLAN**  
**2021-2022**

Class: III PHYSICS

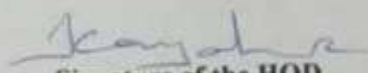
Semester: V

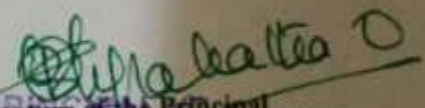
Sub. Code: 174EV5

Title of the Paper: Environmental studies

Total Hours: 30

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	Natural Resources - Water Renewable Resources - Forest Resources - Soil Resources - Food Resources - Energy Resources -Non Renewable Resources	6	Online mode	M. Preethi
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	Online mode	M. Preethi
August	III	<b>Biodiversity and Conservation:</b> - What is Biodiversity - Levels of Biodiversity - Values of Biodiversity - Consumptive use value -Social benefits -Cultural Values - India as a Mega Diversity Nation - Conservation and its significance.	6	Online mode	M. Preethi M.R. Guru lakshmi
September	IV	<b>Pollution :</b> - Types of Pollutants - Types of Pollution - Air Pollution -Water Pollution - Thermal Pollution - Marine Pollution - Soil Pollution - Control Measures -Noise Pollution - Radiation Pollution.	6	Online mode	M.R. Guru lakshmi
October	V	<b>Environmental Ethics and Social Issues :-</b> Attitudes of Major Religions towards theEnvironment -Human Population and Environment -GlobalizationEnvironment -Global Environmental Issues -Alternative Lifestyles -Role of Individuals, Organisations and Government in protecting the Environment	6	Online mode	M.R. Guru lakshmi

  
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## LESSON PLAN

2021-2022

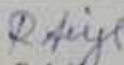
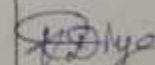
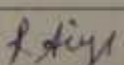
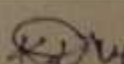
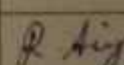
Class: I Maths

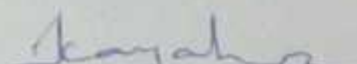
Semester: I

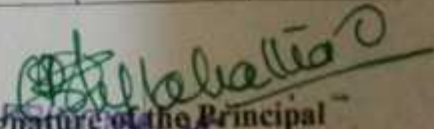
Sub. Code: 21AP1

Title of the Paper: Mechanics , Properties of matter and Sound

Total Hours: 60

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Force, Work, 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-Work –Work done by a varying force –Energy-Kinetic energy-Potential energy- Power.	12	Online mode	 R. Ariya Nachiyar
July	II	<b>Rotational Motion:</b> Angular velocity-Angular acceleration-Normal acceleration -Centripetal force – Centrifugal force- Torque –Angular momentum-Expression for torque in rotational motion-Expression for angular momentum of a rotating rigid body-Kinetic energy of rotation- Expression for work and power in rotational motion - Moment of inertia -Perpendicular axes theorem –Theorem of parallel axes-Moment of Inertia of circular disc, Solid sphere .	12	Online mode	 K. Divya
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	Online mode	 R. Ariya Nachiyar
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-Work done in twisting -Torsional oscillations of a body-Rigidity modulus by Torsion pendulum.	12	Online mode	 K. Divya
October	V	<b>Sound:</b> Simple Harmonic Motion - Composition of two S.H.M in a straight line-Beats- Progressive waves and their properties- Stationary waves and their properties-Melde's experiment -Transverse and longitudinal mode of vibration-Acoustics of buildings-Ultrasonics, Production and applications.	12	Online mode	 R. Ariya Nachiyar K. Divya

  
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## LESSON PLAN

2021-2022

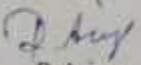
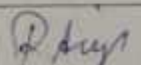
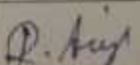
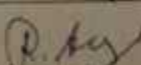
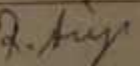
Class: II Chemistry

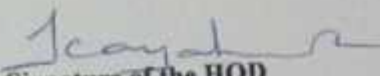
Semester: III

Sub. Code: 17AP1

Title of the Paper: Mechanics , Properties of matter and Sound

Total Hours: 30

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Force, Work, 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-Work – Work done by a varying force –Energy-Kinetic energy- Potential energy- power.	6	Online mode	 R. Ariya Nachiyar
July	II	<b>Rotational Motion</b> - Angular velocity-Angular acceleration-normal acceleration -Centripetal forces – Centrifugal force-Torque –Angular momentum-Expression for torque in rotational motion-Expression for angular momentum of a rotating rigid body-Kinetic energy of rotation- Expression for work and power in rotational motion - Moment of inertia –Perpendicular axes theorem –Theorem of parallel axes-Moment of Inertia of Thin circular ring, circular disc, Solid cylinder, Solid sphere.	6	Online mode	 R. Ariya Nachiyar
August	III	<b>Gravitation</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.	6	Online mode	 R. Ariya Nachiyar
September	IV	<b>Elasticity</b> -Different moduli of Elasticity-Poisson's ratio-Bending of beams –expressions for bending moment-determination of young's modulus by uniform and non uniform bending – torsion of a cylinder-work done in twisting -Torsional oscillations of a body-Rigidity modulus by Torsion pendulum.	6	Online mode	 R. Ariya Nachiyar
October	V	<b>Sound-Simple harmonic Motion</b> - composition of two S.H.M in a straight line-Beats progressive waves and their properties- -stationary waves and their properties- Melde's experiment -transverse and longitudinal modes-acoustics of buildings-ultrasonics, Production and applications	6	Online mode	 R. Ariya Nachiyar

  
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2021-2022






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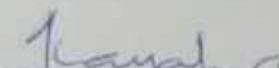
Semester: III

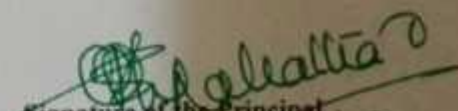
Sub. Code: 17AP3

Title of the Paper: Electricity & Electronics

Total Hours: 30

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-Carey foster bridge-Potentiometer	6	Online mode	 S. Ameer Nisha Bibi
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.	6	Online mode	 S. Ameer Nisha Bibi
August	III	<b>Semiconductor Physics</b> Semiconductor-Intrinsic semiconductor-Extrinsic semiconductor-n type semiconductor-p type semiconductor-pn junction-properties of pn junction-Current flow in a forward biased pn junction-Volt ampere characteristics of pn junction.	6	Online mode	 S. Ameer Nisha Bibi
September	IV	<b>Operational Amplifier</b> Operational amplifier- Schematic symbol of operational amplifier-output voltage from op-amp- Bandwidth of an op-amp- slew rate-Frequency response of an op-amp with negative feedback-Inverting Amplifier-Noninverting amplifier-voltage follower- Summing amplifier.	6	Online mode	 S. Ameer Nisha Bibi
October	V	<b>Logic gates</b> Decimal to binary conversion-Binary to decimal conversion- OR gate-AND gate- NOT gate-Combination of basic logic gates- NAND Gate as a universal Gate- Boolean theorems- DeMorgans theorems	6	Online mode	 S. Ameer Nisha Bibi

  
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**LESSON PLAN**  
2021-2022

Class: III Chemistry

Semester: V

Sub. Code: 17AP3

Title of the Paper: Electricity & Electronics

Total Hours: 30

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-Carey foster bridge-Potentiometer	6	Online mode	 K. Divya
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.	6	Online mode	 K. Divya
August	III	<b>Semiconductor Physics</b> Semiconductor-Intrinsic semiconductor-Extrinsic semiconductor-n type semiconductor-p type semiconductor-pn junction-properties of pn junction-Current flow in a forward biased pn junction-Volt ampere characteristics of pn junction.	6	Online mode	 E. Chris Monica
September	IV	<b>Operational Amplifier</b> Operational amplifier- Schematic symbol of operational amplifier-output voltage from op-amp-Bandwidth of an op-amp- slew rate-Frequency response of an op-amp with negative feedback-Inverting Amplifier-Noninverting amplifier-voltage follower- Summing amplifier.	6	Online mode	 E. Chris Monica
October	V	<b>Logic gates</b> Decimal to binary conversion-Binary to decimal conversion- OR gate-AND gate- NOT gate-Combination of basic logic gates- NAND Gate as a universal Gate- Boolean theorems- DeMorgans theorems	6	Online mode	 E. Chris Monica

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**LESSON PLAN**  
**2021-2022**

Class: I B.Sc Physics

Semester: II

Sub. Code: 21P21

Title of the Paper: Heat & Thermodynamics

Total Hours: 60

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	Calorimetry: Definitions - Newton's law of cooling-Specific heat of liquid-Calendar and Barne's Continuous flow method -Two Specific heats of a gas - Specific heat of a gas at constant volume by Joly's Differential Steam Calorimeter-Specific heat of a gas at constant pressure by Regnault's method- Dulong and Petit's law.	12	Chalk and Talk	 K.Dhivya
July	II	Transmission of Heat: Introduction - Coefficient of thermal conductivity- Lee's disc method for bad conductors-Spherical shell method (Radial flow of heat )- Cylindrical flow of heat - Thermal conductivity of Rubber - Thermal conductivity of Glass- Wiedemann -Franz law.	12	Chalk and Talk	 R. Ariya Nachiyar
August	III	<b>Radiation:</b> Introduction- Thermal Radiation - Applications of heat radiation - Blackbody-Black body in practice-Stefan-Boltzmann law-Wien's Displacement law- Rayleigh-Jeans law-Planck's Radiation law-Planck's Quantum Postulates- Experimental verification of Stefan's law- Solar constant- temperature of sun.	12	Chalk and Talk	 K.Dhivya
September	IV	<b>Kinetic Theory of Gas:</b> Kinetic model (Postulates of kinetic theory of gases)-Degrees of freedom - Maxwell's law of equipartition of energy- Specific heats of Mono -Di and polyatomic gas-Adiabatic Expansion of an Ideal gas-Mean free path-Transport Phenomena-Viscosity Transport of Momentum.	12	Chalk and Talk	 R. Ariya Nachiyar
October	V	First Law of Thermodynamics- Adiabatic process-Isothermal process- Clement and Desormes method Determination of $\gamma$ -Second Law of thermodynamics- Carnot's Ideal heat engine - change in entropy- Entropy in adiabatic and reversible ,irreversible process-Relation of thermodynamical Potentials with their variables(Maxwell's equations)	12	Chalk and Talk & Seminar	 K.Dhivya R. Ariya Nachiyar 

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**LESSON PLAN**  
**2021-2022**

Class: I B.Sc Physics

Semester: II

Sub. Code: 21SEP21

Title of the Paper: Electronic Instrumentation

Total Hours: 30

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Power supplies-</b> Introduction-Linear mode power supply-Requirements of linear mode power supply-rectifiers-half wave rectifier - full wave rectifier -bridge rectifier - Advantages of the bridge rectifier.	6	Chalk and Talk	<i>B. Subha</i>
July	II	<b>Cathode ray oscilloscope-CRO</b> - Vertical and horizontal voltage amplifiers- Power supply circuits- Cathode ray tube - Special Oscilloscopes- Applications of CRO.	6	Chalk and Talk	<i>S. Priyanka</i>
August	III	<b>Ammeter, Voltmeter, Ohmmeter-</b> Ammeter - DC voltmeter - Vacuum Tube Voltmeter - VTVM Using Vacuum Tube Diode -VTVM Using Triodes -Digital voltmeter-Ohmmeter-Series type ohmmeter - shunt type ohmmeter.	6	Chalk and Talk	<i>B. Subha</i> <i>S. Priyanka</i>
September	IV	<b>Multimeter</b> Digital multimeter - Measurement of resistance measurement of inductance - measurement of capacitance - measurement of Q	6	Chalk and Talk	<i>B. Subha</i>
October	V	<b>Measuring Instruments-</b> Frequency meter - Time meter-Energy meter -Power meter -Watt meter -Electrodynamometer Watt meter.	6	Chalk and Talk & Seminar	<i>S. Priyanka</i>

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**LESSON PLAN**  
**2021-2022**

Class: I B.Sc Physics

Semester: II

Sub. Code: 21SEP22

Title of the Paper: Electricity

Total Hours: 30

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Electrostatics:</b> Electric field and flux – Gauss law-Derivation of Coulomb's law from Gauss law-Differential form(Maxwell equation)-Field due to a uniformly charged sphere – Coloumb's theorem –Mechanical force on the surface of a charged conductors –Potential-Electric potential –Potential due to a point charge-equipotential surface-relation between field and potential-electric potential energy.	6	Chalk and Talk	<i>P. Revathi</i> P.Revathi
July	II	<b>Current electricity :</b> Current –Current density-Expression for current density –Resistance and resistivity-Kirchhoff's laws –Application to Wheat stone's network –Carey foster's bridge –Determination of resistivity and temperature coefficient of resistance - Potentiometer – measurement of potential and calibration of voltmeter and Ammeter.	6	Chalk and Talk	<i>P. Revathi</i> P.Revathi
August	III	<b>Capacitors:</b> Introduction –Concept of capacitance –capacitance of an isolated spherical conductor –parallel plate capacitor with a dielectric- Dielectric strength	6	Chalk and Talk	<i>P. Revathi</i> P.Revathi E.Chris Monica <i>E. Chris Monica</i>
September	IV	<b>Alternating currents :</b> Introduction – Impedance ,Reactance and Admittance-Alternating voltage applied across a resistance –Alternating voltage applied across an inductance- Alternating voltage applied across a capacitance.	6	Chalk and Talk	<i>E. Chris Monica</i> E.Chris Monica
October	V	<b>Thermo electricity:</b> Introduction –Seebeck effect- variation of thermo - emf with temperature –Peltier effect –Explanation of Seebeck and Peltier effect-Peltier coefficient – Thomson effect and its prediction -EMF in a thermocouple.	6	Chalk and Talk & Seminar	<i>E. Chris Monica</i> E.Chris Monica

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2021-2022

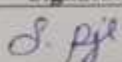

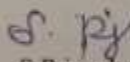

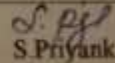
Class: I B.Sc Physics

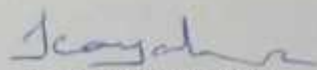
Semester: II

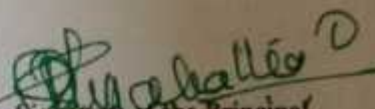
Sub. Code: 21NMP2

Title of the Paper: Astrophysics

Total Hours: 30

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>The earth</b> The zones of earth- shape of the earth- radius of the earth- rotation of earth-Foucault's pendulum experiment-gyroscope experiment.	6	Chalk and Talk	 S.Priyanka
July	II	<b>The moon</b> Introduction- phases of moon- successive phases of moon- lunar librations- summer and winter full moons- path of the moon with respect to the sun- Surface structure of the moon- The tides.	6	Chalk and Talk	 S.Ameer Nisha Bibi
August	III	<b>The solar system</b> -Introduction- The sun- Mercury- Venus-Mars- Asteroids- Jupiter- Saturn- Uranus-Neptune	6	Chalk and Talk	 S.Priyanka
September	IV	<b>The stellar universe</b> -Introduction- Stellar motion- Solar motion- Constellation- The milky way-survey of constellations-winter constellations-spring constellations-summer constellations-autumn constellations	6	Chalk and Talk	 S.Ameer Nisha Bibi
October	V	<b>Stars</b> -Introduction- Distance of stars- Magnitude of stars- Absolute magnitudes- The colour and size of the stars- Star clusters	6	Chalk and Talk & Seminar	 S.Priyanka S.Ameer Nisha Bibi

  
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**LESSON PLAN**  
**2021-2022**

Class: II B.Sc Physics

Semester: IV

Sub. Code: 17P41

Title of the Paper: Optics

Total Hours: 60

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Interference:</b> Light waves-Superposition of waves-Interference-Theory of interference-Superposition of incoherent waves-Superposition of many coherent waves-Young's double slit experiment-Wavefront division-Coherence-Condition for interference-Fresnel Biprism(Experimental arrangement, Determination of wavelength of light)-Newton's rings-Condition for Bright and Dark rings-Michelson's interferometer(Construction and Working)	12	Chalk and Talk	 S. Ameer Nisha Bibi
July	II	<b>Diffraction:</b> Huygens-Fresnel theory-Fresnel's assumptions-Rectilinear propagation of light-Zone plate-Distinction between interference and diffraction-Fresnel and Fraunhofer types of diffraction-Diffraction at a circular aperture. <u>Fraunhofer Diffraction:</u> Fraunhofer diffraction at a single slit(Theory only)-Fraunhofer diffraction at a circular aperture.	12	Chalk and Talk	 S. Ameer Nisha Bibi
August	III	<b>Polarization:</b> Polarization-Unpolarized and polarized light-Natural light is unpolarized light-Types of polarization -Brewster's law-Polarizer and Analyser(only)-Malus's law, Huygen's explanation of Double refraction-Nicol prism-Effect of polarizer on light of different polarizations.	12	Chalk and Talk	 S. Ameer Nisha Bibi K. Divya
September	IV	<b>Lasers:</b> Attenuation of light in an optical medium-Thermal equilibrium-Interaction of light with matter-Einstein coefficients and their relations-Light amplification-Meeting the three requirements-Components of laser-Lasing action-Types of lasers-Ruby laser-ND:YAG laser-Helium-Neon laser.	12	Chalk and Talk	 K. Divya
October	V	<b>Fibre optics:</b> Optical fibre-Total internal reflection-Propagation of light through an optical fibre-Fractional refractive index change-Numerical aperture-Skip distance and Number of total internal reflection-Modes of propagation -The three types of fibres-Bandwidth-Characteristics of the fibres.	12	Chalk and Talk & Seminar	 K. Divya

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

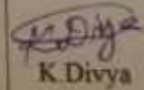
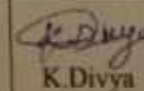
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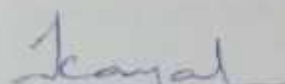
Sub Code: 17P61

Semester: VI

Title of the Paper: Solid State Physics

Total Hours: 60

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Interatomic force &amp; bonding in solids:</b> <b>Interatomic force:</b> Introduction - Force between atoms-Cohesion of Atoms and Cohesive energy - calculation of Cohesive energy. <b>Bonding in solids:</b> Ionic Bonding -Bond energy of NaCl Molecule-Calculation of Lattice energy of Ionic crystal- The Born -Haber cycle - Properties of Ionic solids - Examples of Ionic solids -Covalent bond -Metallic bond -Hydrogen bond.	12	Chalk and Talk	 S. Ameer Nisha Bibi
July	II	<b>Crystal physics:</b> Introduction -Lattice points and space lattice - Unit cells and Lattice parameters-Crystal systems-Metallic crystal structures for SC, BCC, & FCC structures - Other cubic crystal structure - Miller Indices & important features of Miller Indices <b>X-ray diffraction &amp; diffraction method:</b> Bragg's law - Derivation of Bragg's equation.	12	Chalk and Talk	 S. Ameer Nisha Bibi
August	III	<b>Magnetism in solids:</b> Magnetic Terminology -Types of Magnetism - Dia magnetism -(Langevin's classical theory)- Paramagnetism -(Langevin's classical theory)-Ferro magnetism-Weiss theory-concepts of Domains and Hysteresis- Anti Ferro magnetism-Ferri magnetism.	12	Chalk and Talk	 S. Ameer Nisha Bibi K. Divya
September	IV	<b>Super conductivity:</b> Introduction -Electrical Resistivity -Perfect Diamagnetism or Meissner Effect - Super currents and Critical Temperature -Type-I -Type-II Superconductors.	12	Chalk and Talk	 K. Divya
October	V	<b>Semi conductors:</b> Introduction -Pure or Intrinsic Semiconductors - Impurity or Extrinsic Semiconductor -Drift velocity, Mobility and conductivity of intrinsic semiconductors-Carrier concentration and Fermi level for intrinsic semiconductors.	12	Chalk and Talk & Seminar	 K. Divya

  
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**LESSON PLAN**  
**2021-2022**

Class: III B.Sc Physics

Semester: VI

Sub Code: 17P62

Title of the Paper: Spectroscopy

Total Hours: 60

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Spectra of atoms</b> Angular Momentum of Many Electron Atoms -Normal Zeeman effect-Anomalous Zeeman Effect- Paschen-Bach Effect-Influence of Nuclear Spin- Hyperfine Structure-Stark Effect-Rydberg Atoms-Lamb Shift-Characteristic X-Ray Spectra-Moseley's Law.	12	Chalk and Talk	<i>E. Chris Monica</i> E.Chris Monica
July	II	<b>Rotation of molecules</b> Classification of molecules - Interaction of radiation with rotating molecule - Rotational spectra of rigid Diatomic molecule - Isotope effect in Rotational spectra - Intensity of Rotational lines - Non-rigid rotator - Vibrational excitation effect - Linear polyatomic molecules - Symmetric top molecules - Asymmetric top molecules.	12	Chalk and Talk	<i>E. Chris Monica</i> E.Chris Monica
August	III	<b>IR spectroscopy-diatomic molecule</b> Introduction-Vibrational Energy of a Diatomic Molecule -Infrared Selection rules-Vibrating Diatomic Molecule-Diatomic Vibrating Rotator-Asymmetry of Rotation-Vibration Band- rotation - Vibration spectra of polyatomic molecules.	12	Chalk and Talk	<i>E. Chris Monica</i> E.Chris Monica
September	IV	<b>Raman spectroscopy</b> Introduction- Theory of Raman Scattering- Rotational Raman Spectra- Vibrational Raman Spectra- Mutual Exclusion Principle -Industrial Applications- Raman Microscopy.	12	Chalk and Talk	<i>E. Chris Monica</i> E.Chris Monica
October	V	<b>Electronic spectra of Diatomic molecules</b> Introduction -Vibrational Coarse Structure- Franck-Condon Principle- Intensity of Vibrational Electronic Spectra- Rotational Fine Structure of Electronic- Vibration Spectra- Photoelectron Spectroscopy.	12	Chalk and Talk & Seminar	<i>E. Chris Monica</i> E.Chris Monica

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**LESSON PLAN**  
**2021-2022**

Class: III B.Sc Physics

Semester: VI

Sub Code: 17PE6A

Title of the Paper: Theoretical Physics

Total Hours: 60

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Classical Mechanics</b> Conservative Forces-Conservation theorem for energy of a particle-Mechanics of a system of particles-Degrees of Freedom - Constraints- Types of Constraints -Generalized coordinates- Transformation Equations - D'Alembert's Principles-Lagrangian Functions-Lagrange's Equation of Motion - Derivation of Lagrange's Equation of Motion -Application of Lagrange's Equation- Simple Pendulum - Compound Pendulum - The Atwood's Machine - The Hamiltonian Function H - Hamiltonian equation with derivation.	12	Chalk and Talk	 M.R.Guru lakshmi
July	II	<b>Statistical Mechanics</b> Microscopic and Macroscopic descriptions-Ensembles-Degenerate and Non degenerate Ensembles-Phase space-Micro and Macro states- Thermodynamic probability- Boltzmann's theorem on entropy and probability -Derive the Boltzmann relation connecting entropy and Probability-Fundamental postulates of statistical mechanics- Statistical equilibrium. Maxwell-Boltzmann distribution law-Application of Maxwell-Boltzmann distribution law to an ideal gas-Maxwell-Boltzmann velocity distribution law.	12	Chalk and Talk	 E.Chris Monica M.R.Guru lakshmi E.Chris Monica
August	III	<b>Quantum Statistics</b> Introduction-Quantum statistics of identical particles - Bose-Einstein distribution law-Application of B.E Statistics-Planck's law of radiation-deduction-Wien's and Rayleigh-Jean's law-Fermi Dirac Distribution Law - Application of Fermi Dirac Statistics-Comparison of three statistis.	12	Chalk and Talk	 M.R.Guru lakshmi
September	IV	<b>Wave Mechanics</b> Introduction- The De-Broglie wavelength- Davison and Germer's Experiment- G.P.Thomson's experiment- Wave velocity of De-Broglie waves- Group velocity of De- Broglie waves- Expression for Group velocity- Relation between group velocity and wave velocity-Heisenberg's Uncertainty principle.	12	Chalk and Talk	 E.Chris Monica
October	V	<b>Relativity</b> Frames of reference-Galilean transformation equation-Michelson Morley experiment-Postulates of Special theory of Relativity-Lorentz transformation equations-Derivation of the Lorentz transformation equations - Einstein's Mass- Energy Relation- Relation between the total energy, rest energy and the Momentum.	12	Chalk and Talk & Seminar	 E.Chris Monica

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**LESSON PLAN**  
**2021-2022**

Class: III B.Sc Physics

Semester: VI

Sub Code: 17SEP61

Title of the Paper: Introduction to Microcontroller 8051

Total Hours: 30

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Introduction to Microcontrollers</b> Introduction - Microcontrollers and Microprocessors- History of Microcontrollers and Microprocessors- Embedded Versus External Memory Devices- 8-bit and 16-bit Microcontrollers-CISC and RISC and Processors- Harvard and Von Neumann Architectures-Commercial Microcontroller Devices	6	Chalk and Talk	 R. Ariya Nachiyar K. Divya
July	II	<b>8051 Microcontrollers</b> Introduction- MCS -51 Architecture -Registers in MCS-51- General-purpose or working Registers - Stack pointer and program counter - Special Function Registers (SFR).	6	Chalk and Talk	 R. Ariya Nachiyar
August	III	<b>8051 Pin Description, Connections, I/O Ports and Memory Organization</b> 8051 Pin Description-8051 Connections -8051 Parallel I/O Ports-Memory Organization.	6	Chalk and Talk	 K. Divya
September	IV	<b>MCS-51 Addressing Modes and Instructions</b> 8051 Addressing Modes- MCS-51 Instruction Set-8051 Instructions and Simple Programs- Using Stack Pointer.	6	Chalk and Talk	 R. Ariya Nachiyar
October	V	<b>8051 Assembly Language Programming Tools</b> 8051 Assembly Language Programming - 8051 assembler - 8051 programming Template - Development Systems and Tools - Software Simulators of 8051.	6	Chalk and Talk & Seminar	 K. Divya

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**LESSON PLAN**  
**2021-2022**

Class: III B.Sc Physics

Semester: VI

Sub Code: 174VE6

Title of the Paper: Value Education

Total Hours: 30

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	Value Education – Need and Importance – Objectives - Types of Values-Nature and concept of Moral education –Value Education Vs Moral Education.	6	Chalk and Talk	S. Pj S.Priyanka
July	II	Values of Home –Role of Women in Decision Making –Parental Care-Care of the Aged –Family Conflicts and Resolutions-Gender Justice-Social Justice- Social Integration- Socio Political Awareness.	6	Chalk and Talk	S. Ameer Nisha Bibi
August	III	Character Formation towards Positive Personality – Truthfulness, Sacrifice, Sincerity, Self control, Altruism, Tolerance, Confidence, Honesty and Courage.	6	Chalk and Talk	S. Pj S.Priyanka
September	IV	Karma Yoga in Hinduism –Love and Justice in Christianity –Brotherhood in Islam, Compassion in Buddhism –Ahimsa in Jainism and Courage in Sikhism –Need for Religious Harmony	6	Chalk and Talk	S. Ameer Nisha Bibi
October	V	Human rights –Fundamental Rights –Human Rights Act 1993 (Amended 2006)- Consumer Protection Act 1986 –Right to Information Act 2005 –Right to Education Act 2009-Protective Laws for Women –Dowry Prohibition Act 1961 (Amended 1986)And Domestic Violence Act 2005- Constitutional Values- Liberty- Democracy – International Peace	6	Chalk and Talk & Seminar	S. Pj S.Priyanka S. Ameer Nisha Bibi

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**LESSON PLAN**  
**2021-2022**

Class: I Maths

Semester: II

Sub. Code: 21AP2

Title of the Paper: Thermal Physics

Total Hours: 60

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Thermal expansion:</b> Linear expansion of solids- Linear expansivity of crystals-Determination of $\alpha$ by Air Wedge method- Expansion of anisotropic solids- Solids of low expansivity and their uses-Anomalous expansion of water - Thermostat- Bimetallic thermostat -Isothermal change-Adiabatic change-Equation for the adiabatic change of a perfect gas-The two specific heat capacities of a gas-Difference between the two specific heat capacities-Joly's differential steam calorimeter for finding $C_v$ -Regnault's method to find $C_p$ .	12	Chalk and Talk	<i>E. Chris Monica</i> E. Chris Monica
July	II	Introduction-Lee's disc method of determining the thermal conductivity of bad conductor-Analogy between heat flow and electric current-Wiedemann -Franz law-Thermal conductivity of air-Lee's disc method-Convection - Convection in the atmosphere- Lapse rate-Stability of the atmosphere- Green house effect- Atmospheric pollution	12	Chalk and Talk	<i>E. Chris Monica</i> E. Chris Monica
August	III	Introduction-Stefan's law -Determination of Stefan's constant by filament heating method -Solar constant - Determination of solar constant by water flow Pyrheliometer-Temperature of the sun - Temperature of the sun using Wien's Displacement law-Solar spectrum-Energy distribution in black body spectrum- Statement of Planck's law of radiation-Wien's law -Rayleigh Jean's law.	12	Chalk and Talk	<i>E. Chris Monica</i> E. Chris Monica
September	IV	Postulates of the kinetic theory of gases- Expression for the pressure of a gas-Mean free path-Transport phenomena-Expression for the coefficient of Diffusion and viscosity-Expression for the coefficient of thermal conductivity-Maxwell's law of distribution of molecular speeds-Degrees of freedom-Boltzmann's law of equipartition of energy-Atomicity of gases.	12	Chalk and Talk	<i>E. Chris Monica</i> E. Chris Monica
October	V	Heat engine-Expression for the efficiency of a Carnot's engine- Carnot's theorem -Second law of thermodynamics-Entropy-Changes of entropy in Carnot's cycle-Change of entropy in conversion of ice into steam -Joule Kelvin effect-Porous Plug experiment-Theory of Porous Plug experiment-Adiabatic demagnetization-Superconductivity.	12	Chalk and Talk & Seminar	<i>E. Chris Monica</i> E. Chris Monica

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**LESSON PLAN**  
**2021-2022**

Class: II Maths

Semester: IV

Sub. Code: 17AP4

Title of the Paper: Optics

Total Hours: 60

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Geometrical optics</b> Convex lens -Principal Focus and Focal Planes-Refraction through a thin lens- Definition of Cardinal points and Respective Planes-Dispersion through a Prism-Cauchy's Formula- Achromatic in Prisms- Dispersion without Deviation-Direct vision Spectroscope. <b>Aberrations in Lenses:</b> Spherical aberration in a lens-Chromatic aberration in a lens	12	Chalk and Talk	 K. Divya
July	II	<b>Interference</b> Introduction-Theory of interference fringes-Fresnel's Biprism-Displacement of fringes-Colours of thin films-Newton's rings-Determination of wavelength of sodium light by Newton's rings -Michelson's interferometer-Uses of Michelson's interferometer.	12	Chalk and Talk	 K. Divya
August	III	<b>Diffraction</b> Introduction-Fresnel's explanation of rectilinear propagation of light-Zone plate-Diffraction at a circular aperture-Diffraction at a thin wire-Fraunhofer diffraction at a single slit-Fraunhofer diffraction at a double slit-Plane transmission diffraction grating- Resolving power of telescope-Resolving power of prism-Resolving power of a plane diffraction grating	12	Chalk and Talk	 K. Divya R. Ariya nachiyar
September	IV	<b>Polarisation</b> Introduction-Polarisation by reflection-Pile of plates-Law of Malus-Double refraction- Huygen's theory of double refraction in uniaxial crystals-Huygen's construction for double refraction in uniaxial crystals-Quarter wave plate-Half wave plate-Laurent's half shade polarimeter	12	Chalk and Talk	 R. Ariya nachiyar
October	V	<b>Spectroscopy</b> Introduction-Infrared spectroscopy-Ultraviolet spectroscopy-Rayleigh's scattering-Raman effects-Experimental study of Raman effect-Quantum theory of raman effect-Application of raman effect-Nuclear magnetic resonance.	12	Chalk and Talk & Seminar	 R. Ariya nachiyar

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## LESSON PLAN

2021-2022

Class: II Chemistry

Semester: IV

Sub. Code: 17AP2

Title of the Paper: Thermal Physics

Total Hours: 60

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Thermal expansion</b> - Linear expansion of solids- Linear expansivity of crystals-Determination of $\alpha$ by air wedge method-Expansion of anisotropic solids- Solids of low expansivity and their uses-Anomalous expansion of water -Thermostat-Bimetallic thermostat -Isothermal change-Adiabatic change-Equation for the adiabatic change of a perfect gas-The two specific heat capacities of a gas-Difference between the two specific heat capacities-Joly's differential steam calorimeter for finding $C_v$ -Regnault's method to find $C_p$ .	12	Chalk and Talk	<i>E. Chris Monica</i> E. Chris Monica
July	II	<b>Conduction</b> -Introduction-Lee's disc method of determining the thermal conductivity of bad conductor-Analogy between heat flow and electric current-Wiedemann -Franz law-Thermal conductivity of air-Lee's disc method-Convection -Introduction -Convection in the atmosphere- Lapse rate-Stability of the atmosphere- Green house effect- Atmosphere pollution	12	Chalk and Talk	<i>E. Chris Monica</i> E. Chris Monica
August	III	<b>Radiation</b> -Introduction-Stefan's law -Determination of Stefan's constant by filament heating method -Solar constant -Determination of solar constant by water flow pyrheliometer-Temperature of the sun - Temperature of the sun using Wein's Displacement law-Solar spectrum-Energy distribution in black body spectrum- Statement of planck's law of radiation-Wien's law -Rayleigh jean's law.	12	Chalk and Talk	<i>E. Chris Monica</i> E. Chris Monica K. Divya
September	IV	<b>Kinetic theory of gases</b> -Postulates of the kinetic theory of gases- Expression for the pressure of a gas-Mean free path-Transport phenomena-Expression for the coefficient of Diffusion and viscosity-Maxwell's law of distribution of molecular speeds-Degrees of freedom-Boltzmann's law of equipartition of energy-Atomicity of gases.	12	Chalk and Talk	<i>K. Divya</i> K. Divya
October	V	<b>Thermodynamics</b> -Heat engine-Expression for the efficiency of a carnot's theorem- Carnot's theorem -Second law of thermodynamics-Entropy-Changes of entropy in carnot's cycle-Change of entropy in conversion of ice into steam. Low Temperature Physics-Joule Kelvin effect- Porous plug experiment -Theory of Porous plug experiment- Adiabatic demagnetisation-Superconductivity.	12	Chalk and Talk & Seminar	<i>K. Divya</i> K. Divya

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## LESSON PLAN

2021-2022

Class: III Chemistry


Semester: VI

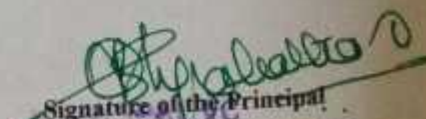
Sub. Code: 17AP4

Title of the Paper: Optics

Total Hours: 60

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Geometrical optics</b> Convex lens -Principal Focus and Focal Planes-Refraction through a thin lens- Definition of Cardinal points and Respective Planes-Dispersion through a Prism-Cauchy's Formula- Achromatic in Prisms- Dispersion without Deviation-Direct vision Spectroscope. <b>Aberrations in Lenses:</b> Spherical aberration in a lens-Chromatic aberration in a lens	12	Chalk and Talk	E.Chris Monica E.Chris Monica
July	II	<b>Interference</b> Introduction-Theory of interference fringes-Fresnel's Biprism-Displacement of fringes-Colours of thin films-Newton's rings-Determination of wavelength of sodium light by Newton's rings -Michelson's interferometer-Uses of Michelson's interferometer.	12	Chalk and Talk	E.Chris Monica E.Chris Monica
August	III	<b>Diffraction</b> Introduction-Fresnel's explanation of rectilinear propagation of light-Zone plate-Diffraction at a circular aperture-Diffraction at a thin wire-Fraunhofer diffraction at a single slit-Fraunhofer diffraction at a double slit-Plane transmission diffraction grating- Resolving power of telescope-Resolving power of prism-Resolving power of a plane diffraction grating	12	Chalk and Talk	E.Chris Monica E.Chris Monica K.Divya
September	IV	<b>Polarisation</b> Introduction-Polarisation by reflection-Pile of plates-Law of Malus-Double refraction- Huygen's theory of double refraction in uniaxial crystals-Huygen's construction for double refraction in uniaxial crystals-Quarter wave plate-Half wave plate-Laurent's half shade polarimeter	12	Chalk and Talk	K.Divya K.Divya
October	V	<b>Spectroscopy</b> Introduction-Infrared spectroscopy-Ultraviolet spectroscopy-Rayleigh's scattering-Raman effects-Experimental study of Raman effect-Quantum theory of raman effect-Application of raman effect-Nuclear magnetic resonance.	12	Chalk and Talk & Seminar	K.Divya K.Divya

  
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## **LESSON PLAN 2021-2022**

**DEPARTMENT OF PHYSICS  
(PG – Odd & Even Semester)**



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## LESSON PLAN

2021-2022

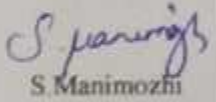
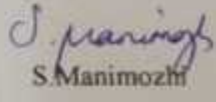
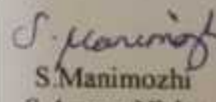



Class : I M.Sc Physics


Sub. Code : 21OPP11

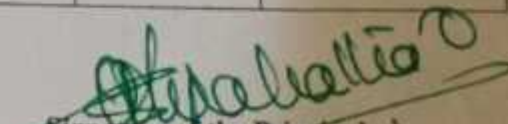
Title of the Paper: Mathematical Physics I

Semester : I

Total Hours : 75 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Vectors</b> Gradient - The Divergence and Gauss's Theorem - The curl of a vector field and Stokes theorem - Green's theorem-Orthogonal curvilinear coordinates - Expression for gradient, divergence, curl and laplacian in cylindrical and Spherical coordinates-Application of vectors to Hydrodynamics - Equation of heat flow in solids-The gravitational potential	15	Online mode	 S. Manimozhi
July	II	<b>Matrices</b> Vectors as Matrices - Solution of linear equations - Linear transformations - Orthogonal and Unitary transformations - Similarity transformations - Eigen values, Eigen vectors, Characteristic equation of a matrix - Cayley - Hamilton theorem - Important theorems of Eigen values and Eigen vectors - Diagonalization of matrices	15	Online mode	 S. Manimozhi
August	III	<b>Tensors</b> Introduction - Coordinate transformation - Scalars, Contravariant vectors and Covariant vectors - Algebraic operation of Tensors - Symmetric and Antisymmetric Tensors - Differentiation of Tensors - Covariant differentiation of vectors - Simple Applications of tensors.	15	Online mode	 S. Manimozhi S. Ameer Nisha Bibi 
September	IV	<b>Complex Variables</b> Introduction - Analytic function- Cauchy Riemann differential equations - Line integral of complex functions- Cauchy integral theorem (simple proof) - Cauchy integral formula - Taylor's and Laurent's series-Singularities of an analytic function - Residues and their Evaluation - Cauchy Residue theorem	15	Online mode	 S. Ameer Nisha Bibi
October	V	<b>Group Theory</b> Introduction- Definitions of theorems of group theory - defining properties of a group - some examples of groups - Sub groups - Classes - Classes of symmetry operations - Representation of groups - Reducible and Irreducible representation-The great Orthogonality theorem and its consequences - Character table - Representation for cyclic groups.	15	Online mode	 S. Ameer Nisha Bibi

  
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## LESSON PLAN 2021-2022

Class : I M.Sc Physics

Sub. Code : 21OPP12

Semester : I

Title of the Paper: Classical Mechanics

Total Hours : 75 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Lagrangian Methods</b> System of Particles - Conservation of energy - Work energy theorem - Conservative forces - Examples - Generalized coordinates - Degrees of freedom under constraints - D'Alemberts principles - Lagrangian function - Lagrange's equation - Application of Lagrange's equation - Single particle in space - Atwood's Machine - Time - Dependent Constraint.	15	Online mode	 M.R. Guru Lakshmi
July	II	<b>Central field motion</b> Reduction to the equivalent one-body problem - The equation of motion and first integrals - The equivalent one-dimensional problem, and classification of orbits - The virial theorem - The differential equation for the orbit, and integrable power-law potentials - Conditions for closed orbits (Bertrand's theorem) - The Kepler problem: Inverse square law of force - The motion in time in the Kepler problem.	15	Online mode	 M.R. Guru Lakshmi
August	III	<b>Hamiltonian methods</b> Hamiltonian equations of motion - Cyclic coordinates and Routh's procedure - Physical significance of the Hamiltonian - Hamiltonian's equation from variational principle - The principle of least action. Canonical Transformations: The equation of canonical transformations - Examples of canonical transformation - Lagrangian brackets - Poisson brackets - Equations of motion in Poisson bracket notation - The Angular Momentum Poisson bracket relations.	15	Online mode	 M.R. Guru Lakshmi B. Subha 
September	IV	<b>Small Oscillations</b> Formulation of the problem - The Eigen Value equation and the principal axis transformation - Frequencies of free vibration and normal coordinates - Free Vibrations of a linear triatomic molecule - Forced vibrations and the effect of dissipative forces.	15	Online mode	 B. Subha
October	V	<b>Hamilton - Jacobi Theory</b> The Hamilton-Jacobi equation for Hamilton's principal function - The Harmonic oscillator problem as an example of the Hamilton-Jacobi method - The Hamilton - Jacobi equation for Hamilton's characteristic function - Separation of variables in the Hamilton - Jacobi equation - Action-angle variables in systems of one degree of freedom.	15	Online mode	 B. Subha

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**LESSON PLAN**  
**2021-2022**

Class : I M.Sc Physics

Sub. Code : 21OPP43

Title of the Paper: Advanced electronics

Total Hours : 75 Hours

Semester : I

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Semiconductor PN Junction diodes</b> Introduction - N-type semiconductors - P-type semiconductors - PN Junction diodes - Diode current equation - Zener diode - Reverse characteristic - applications - Tunnel diode - V-I Characteristics - Applications - Schottky diode - Applications - JFET - Operation of JFET - Characteristics of JFET - JFET parameters - MOSFETs - Working of a Depletion type MOSFET.	15	Online mode	<i>P.R.L.</i> P.Revathi
July	II	<b>Operational amplifier</b> Evolution of Op-Amp - Symbol and terminals of an Op-Amp, Op-Amp characteristics and parameters - Op-Amp comparators - Schmitt trigger - Inverting amplifier - Inverting summing (Adder) - Non inverting amplifier - Voltage follower - Non inverting summing amplifier - Difference amplifier - Op-Amp differentiator - Op-Amp integrator.	15	Online mode	<i>P.R.L.</i> P.Revathi
August	III	<b>D/A and A/D Converters and IC 555 Timer</b> Binary weighted Resistors D/A Converter - R-2R Resistive ladder D/A Converter - Counter type A/D Converter - Successive approximation A/D Converter - Parallel Comparator A/D Converter - IC 555 timer - Internal structure - Schmitt trigger - Astable Multivibrator - Monostable Multivibrator.	15	Online mode	<i>P.R.L.</i> P.Revathi E.Chris monica <i>E.Chris Monica</i>
September	IV	<b>Karnaugh map &amp; combination circuit</b> Karnaugh map - Minterms - Relation between K map and truth table - 2,3 and 4 Variable K map using Minterms - Don't care conditions - Maxterms - K map using Maxterms - Multiplexers - Demultiplexers - Decoders - Encoders.	15	Online mode	<i>E.Chris Monica</i> E.Chris monica
October	V	<b>Flip flops &amp; Counters</b> Introduction - SR flip flop - SR using NOR gates - clocked SR - Edge triggered - D flip flop - JK flip flop - JK master slave Flip flop - T Flip flop - Register - Shift register - Ring Counter - Asynchronous Counter - Synchronous Counter.	15	Online mode	<i>E.Chris Monica</i> E.Chris monica

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**LESSON PLAN**  
**2021-2022**

Class : I M.Sc Physics  
 Sub. Code : 21OPPE1A

Semester : I

Title of the Paper: Numerical Methods

Total Hours : 75 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Solution of Algebraic and Transcendental Equations</b> The Bisection Method-The Method of False position- The Iteration Method -Newton Raphson Method - Ramanujan's Method-The secant Methods-Solution to system of Nonlinear equations-The method of iteration	15	Online mode	 M.Preethi
July	II	<b>Interpolation</b> Finite Differences-Forward Differences - Backward differences - Central Differences - Detection of errors by use of difference tables-Differences of a polynomial - Newton's formula for interpolation - Central difference interpolation formula-Gauss's central difference formula-detection of errors.	15	Online mode	 M.Preethi
August	III	<b>Least squares and B-splines</b> Fitting a straight Line-Nonlinear Curve Fitting- Curve Fitting by a sum of Exponentials-Weighted least square approximation-Linear Weighted Least squares approximation-Nonlinear Weighted Least squares approximation-Least square solution -Representations of B-splines-computation of B-splines -chebyshev Polynomials -Economization of power series.	15	Online mode	 M.Preethi S.Priyanka 
September	IV	<b>Numerical integration and linear system of equations</b> Numerical integration - Trapezoidal rule - Simpson's 1/3 rule-Simpson's 3/8 rule - Error Analysis- Solution of linear systems-Direct Methods - Matrix Inversion Method-Gauss elimination Method-Solution of linear system Iterative Methods - The Eigen value problem.	15	Online mode	 S.Priyanka
October	V	<b>Numerical solution of ordinary and partial differential equations</b> Introduction-solution by Taylor's series - Picard's method of successive approximations - Euler's method - Modified Euler's method -Error estimates for the Euler method-Runge kutta methods-Laplace's equation- Jacobi's Method - Gauss-Seidel Method.	15	Online mode	 S.Priyanka

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**LESSON PLAN**  
**2021-2022**

Class : I M.Sc Physics  
Sub. Code : 21OPPM1  
Title of the Paper: Renewable energy resources  
Total Hours : 30 Hours

Semester : I

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Fundamentals of Energy Science</b> Introduction-Energy, economy and social development- Classification of energy resources-Consumption trend of primary energy resources- Energy chain-common form of energy- Advantages and disadvantages of conventional energy sources-Environmental aspects of energy.	6	Online mode	<i>E. Chris Monica</i> E.Chris monica
July	II	<b>Solar Energy</b> Introduction-solar collectors-solar water heater-solar industrial heating system-Solar refrigeration and air conditioning systems-Solar cookers-Solar Furnace- -Solar dryer.	6	Online mode	<i>E. Chris Monica</i> E.Chris monica
August	III	<b>Wind Energy</b> Introduction-Origin of winds-Nature of winds-Wind turbine siting-Major applications of wind power- Wind energy storage- Environmental aspects-Wind energy program in India.	6	Online mode	<i>E. Chris Monica</i> E.Chris monica
September	IV	<b>Biomass Energy</b> Introduction- Photosynthesis process-Usable form of biomass, their composition and fuel properties-Biomass resources-Biomass conversion Technologies- Energy farming	6	Online mode	<i>E. Chris Monica</i> E.Chris monica
October	V	<b>Geothermal Energy</b> Introduction -Application- Origin and distribution of geothermal energy- Types of geothermal resources-Analysis of geothermal resources	6	Online mode	<i>E. Chris Monica</i> E.Chris monica

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**LESSON PLAN**  
**2021-2022**

Class : II M.Sc Physics

Sub. Code : 18PP31

Title of the Paper: Solid State Physics I

Semester : III

Total Hours : 75 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 - Direct imaging of atomic structure- Crystal structure data <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- Fourier Analysis of the basis.	15	Online mode	 P Revathi
July	II	<b>Crystal binding and elastic constants</b> Crystals of Inert gas- Vander Waals - Londaon Interaction - Ionic crystals - Electrostatic or Madelung Energy - Covalent crystals - Metallic crystals - Hydrogen bonds - Atomic radii - Analysis of elastic strains - Elastic compliance and stiffness constants - Elastic waves in cubic crystals.	15	Online mode	 P Revathi
August	III	<b>Phonons I - Crystal vibrations</b> Vibrations of crystals with monoatomic basis - First brillouin zone - Group velocity - Two atoms per primitive basis- Quantization of elastic waves - Phonon momentum- Inelastic scattering by phonons. <b>Phonons II-Thermal Properties</b> -Phonon heat capacity - Plack distribution - Debye model for density of states - Anharmonicity crystal interaction- Thermal expansion - Thermal conductivity - Umklapp process.	15	Online mode	 P.Revathi M.Preethi 
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-Number of orbitals in a band.	15	Online mode	 M.Preethi
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-Thermoelectric effects- Semimetals-Super lattices. <b>Fermi surfaces and metals</b> -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.	15	Online mode	 M.Preethi

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**LESSON PLAN**  
**2021-2022**

Class : II M.Sc Physics

Sub. Code : 18PP32

Title of the Paper: Quantum Mechanics I

Total Hours : 75 Hours

Semester : III

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>The Schrodinger Wave Equation</b> Experimental Background – The Old Quantum Theory – Uncertainty and Complementarity –Motion of a free Wave Packet in One Dimension. Development of the Wave equation –Interpretation of the Wave Function –One-dimensional square well. Potential.	15	Online mode	 R. Kayalvizhi
July	II	<b>EigenFunctions and Eigenvalues</b> Interpretative Postulates and Energy Functions-Dynamical variables as operators -Expansion in eigenfunctions-The total-energy operator-Normalization in a box- Orthonormality of energy eigen functions-Reality of the energy eigenvalues-Expansion in energy eigen functions-The closure property-Probability function and expectation value-General solution of the Schrodinger equation- Box Normalization.	15	Online mode	 R. Kayalvizhi
August	III	<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 Motion-Schrodinger picture, Heisenberg picture, Interaction picture- Classical lagrangian and Hamiltonian equations of motion-Poisson brackets and Commutator brackets.	15	Online mode	 R. Kayalvizhi S. Manimozhi 
September	IV	<b>Discrete Eigenvalues : 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.	15	Online mode	 S. Manimozhi 
October	V	<b>Symmetry in Quantum mechanics and Angular Momentum states</b> Space and Time Displacements-Unitary displacement operator-Equation of motion-Symmetry and degeneracy-Time displacement-Commutation Relation for 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 .	15	Online mode	 S. Manimozhi

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## LESSON PLAN

2021-2022

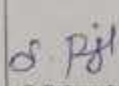
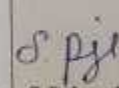
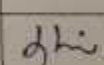
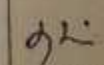
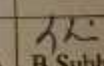
Class : II M.Sc Physics

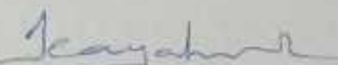
Semester : III

Sub. Code : 18PP33

Title of the Paper: Nuclear Physics

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-Centre of mass frame in nuclear physics.	15	Online mode	 S. Priyanka
July	II	<b>Radioactivity-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>Introduction to Gamma emission</b> Introduction $\gamma$ ray emission -Selection rules-Internal conversion.	15	Online mode	 S. Priyanka
August	III	<b>Nuclear models</b> Binding energy-Semi empirical mass formula-liquid drop model-Nuclear cross section – partial wave analysis of nuclear cross section – Nuclear transmutation - compound nucleus theory – Breit Wigner single level formula-Deuteron problem.	15	Online mode	 B. Subha S. Priyanka
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	Online mode	 B. Subha
October	V	<b>Elementary particles</b> Introduction-Classification of Elementary particles-Fundamental interactions-conservation laws-Hypernuclei-Quarks.	15	Online mode	 B. Subha

  
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**LESSON PLAN**  
**2021-2022**

Class : II M.Sc Physics

Semester : III

Sub. Code : 18PPE3A

Title of the Paper: Nano Physics

Total Hours : 75 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Nano particles and methods of measuring</b> Particle size determination - Transmission Electron Microscopy- Infrared and Raman Spectroscopy - Magic Numbers- Semiconducting Nanoparticles: Optical Properties- Photofragmentation- Coulombic Explosion- Methods of synthesis: RF plasma- chemical methods- Thermolysis- Pulsed Laser methods.	15	Online mode	 V Radhajaya lakshmi
July	II	<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- Giant and colossal Magnetoresistance.	15	Online mode	 M.R. Guru lakshmi
August	III	<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	Online mode	 M.R. Guru lakshmi
September	IV	<b>Polymers and Biological Nanostructure</b> Introduction - Forming and characterizing polymers - Polymers- Polymerization-Sizes of Polymers- Conductive Polymers- Block Copolymers-Supramolecular structures- Transition-metal-Mediated types - Micelles- Biological building blocks- Sizes of Building Blocks and Nano structures-Polypeptide Nanowire and protein Nanoparticles-Biological nano structures- Examples of Proteins- Multilayer Films.	15	Online mode	 V Radhajaya lakshmi M.R. Guru lakshmi
October	V	<b>Nanomachines and nanodevices</b> Microelectromechanical Systems (MEMSs)- Nanoelectromechanical Systems (NEMSs)-Fabrication- Nanodevices and Nanomachines- Molecular and supramolecular switches.	15	Online mode	 V Radhajaya lakshmi

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## LESSON PLAN

2021-2022

Class : I M.Sc Physics

Sub. Code : 21OPP21

Title of the Paper: Mathematical Physics II

Total Hours : 75 Hours

Semester : II

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Differential equation</b> First order differential equation by method of separation of variables-solution of linear differential equation of first order and its solution- solution of linear differential equation of first order by the method of integrating factor-Solution of First order differential equation Reducible to linear form(Bernoulli's equation)-Solution of Second order differential equation by power series solution: Frobenius' method	15	Chalk & Talk	 S.Ameer Nisha Bibi
July	II	<b>Special functions I</b> The Beta function – The Gamma function – Relation between Beta and Gamma function- Legendre's differential equation and Legendre's function – The generating function for $P_n(x)$ – Rodrigue's formula for the Legendre's polynomial - The Legendre's coefficients- $n^{\text{th}}$ orthogonality $P_n(x)$ – Recurrence Formulae- Hermite Differential Equation and Hermite Polynomials- Generating function of Hermite Polynomials- Recurrence Formulae for Hermite Polynomials.	15	Chalk & Talk	 S.Ameer Nisha Bibi
August	III	<b>Special functions II</b> Bessel's differential equation – The Bessel's function of order $n$ of the second kind – Recurrence Formulae –Generating function- Orthonormality of Bessel's Functions: Expansion of an arbitrary function in a Series of Bessel's functions- - Laguerre's Differential equation and Laguerre polynomial-The generating function for Laguerre polynomial - Rodrigue's formula for the Laguerre's polynomial	15	Chalk & Talk	 S.Ameer Nisha Bibi S.Priyanka
September	IV	<b>Partial Differential Equation</b> Partial Differential Equation- Solution of Partial Differential Equation by the method of separation of variables-Solution of laplace's equation in Cartesian coordinates- Solution of heat flow equation: Method of separation of variables-Linear Flow in Semi-infinite solid	15	Chalk & Talk	 S.Priyanka
October	V	<b>Fourier Series, Fourier &amp; Laplace transforms</b> Fourier Series- Half Range Series –Complex Form – Change of Interval- Parseval's theorem- Fourier's Transform – Properties of Fourier's Transform – Fourier Transform of a Derivative – Laplace transform-Properties of Laplace transform	15	Chalk & Talk	 S.Priyanka

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**LESSON PLAN**  
**2021-2022**

Class : I M.Sc Physics

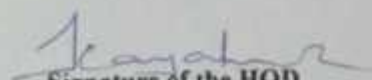
Semester : II

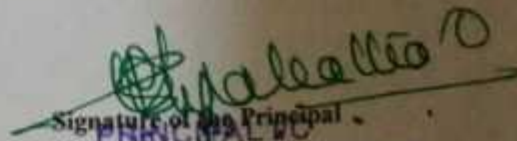
Sub. Code : 21OPP22

Title of the Paper: Thermodynamics and Statistical Mechanics

Total Hours : 75 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Thermodynamics</b> First law of thermodynamics – The Two specific heats – Latent Heat Equations –Entropy a Point Function –Calculation of entropy change in different process – Maxwell's Thermodynamical Relations –The two Tds equations. <b>Applications of laws of thermodynamics</b> Clausius Clapeyron's latent heat equation – The Triple point; Thomson's Theorem– Adiabatic stretching of a wire – Application to Paramagnetic salts; Magneto-Caloric effect – Application to surface Films .	15	Chalk &Talk	P.R.L. P.Revathi
July	II	<b>Phase Space</b> Phase space-Volume in phase space-Number of phase cells in given energy range of harmonic oscillator- Number of phase cells in given energy range of three dimensional free particle-Ensembles-Canonical Ensemble-Microcanonical Ensemble-grand canonical ensemble-uses of ensemble-Liouville's theorem- Stastical Equilibrium-Thermal Equilibrium-Connection between statistical and thermodynamic quantities.	15	Chalk &Talk	P.R.L. P.Revathi
August	III	<b>Method of Ensembles</b> Micro Canonical ensemble – perfect gas in micro canonical ensemble –Gibbs paradox – partition function and its correlation with thermodynamic quantities-Gibbs canonical ensemble-Thermodynamic functions for canonical ensemble-Grand canonical ensemble-Partition function and thermodynamic functions for Grand canonical ensemble-Perfect gas in Grand canonical ensemble-comparison of ensembles.	15	Chalk & Talk	P.R.L. P.Revathi B.Subha dhi
September	IV	<b>Distribution laws</b> Identical particles and symmetry requirements –Bose-Einstein statistics –Fermi-Dirac statistics-Maxwell-Boltzmann statistics-Evaluation of constants $\alpha$ and $\beta$ - Results of three statistics-Thermodynamic Interpretation of the parameters $\alpha$ and $\beta$ -Black body radiation and the Planck radiation law.	15	Chalk & Talk	dhi B.Subha
October	V	<b>Bose Einstein and Fermi dirac gas:</b> Energy and pressure of the gas-Gas degeneracy-Bose Einstein condensation-Liquid Helium-Thermodynamic functions of degenerate Fermi dirac gas-Compressibility of Fermi gas. <b>Phase transistions</b> Phase transistions- Phase transistions of first and second kind-Phase transistions of the second kind: The Ising model -one dimensional ising model	15	Chalk & Talk	dhi B.Subha

  
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LESSON PLAN  
2021-2022

Class : I M.Sc Physics  
Sub. Code : 21OPP23  
Title of the Paper: Electromagnetic theory  
Total Hours : 75 Hours

Semester : II

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Divergence and curl of electric fields</b> Field lines and Gauss law -The divergence of $E$ - Applications of Gauss law -The curl of $E$ . Electric potential: Introduction to potential - Comments on potential - Poisson's equations and Laplace equations - The potential of a localized charge distribution - Electrostatic boundary conditions. <b>Multiple expansion:</b> Approximate potentials at large distances - The monopole and dipole terms - Origin of coordinates in multiple expansions - The electric field of a dipole. Gauss law in the presence of dielectrics - Boundary Conditions.	15	Chalk &Talk	R. Ariya Nachiar
July	II	<b>The divergence and curl of B</b> Straight line currents - The divergence and curl of $B$ - Applications of Ampere's law - Comparison of magneto statics and electrostatics - Magnetic vector potential - Magneto static boundary conditions - Multiple expansion of the vector potentials - The auxiliary magnetic field $H$ -Boundary conditions - Ampere's law in magnetized materials- Faraday's law - Electromagnetic induction - Inductance - Energy in magnetic fields.	15	Chalk &Talk	R. Ariya Nachiar
August	III	<b>Maxwell's equations and potentials</b> Maxwell's equations and magnetic charge -Maxwell's equations in matter - Boundary conditions Potential formulations; Scalar and vector potentials - Gauge transformations - Coulomb Gauge and Lorentz Gauge-Retarded potentials-Lienard-Wiechert potentials - The fields of a point charge in motion -Newton's third law in electrodynamics - Poynting's theorem.	15	Chalk & Talk	R. Ariya Nachiar S. Manimozhi
September	IV	<b>Electromagnetic waves</b> The wave equation in one-dimension - Sinusoidal waves- Boundary conditions -Polarization- The wave equation for $E$ and $B$ -Monochromatic plane waves in vacuum - Energy and momentum of EM waves - Propagation in linear media - Reflection and transmission at normal incidence and oblique incidence-Electromagnetic waves in conductor-Reflection at a conducting surface	15	Chalk & Talk	S. Manimozhi
October	V	<b>Electromagnetic radiation and relativity</b> Dipole radiation - Electric dipole radiation - Magnetic dipole radiation - Radiation from arbitrary Source - Power radiated by a point charge- Radiation reaction - Magnetism as a relativistic phenomenon - The transformation of fields-Relativistic mechanics- Proper time and Proper velocity-Relativistic energy and momentum-The field tensor.	15	Chalk & Talk	S. Manimozhi

  
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**LESSON PLAN**  
**2021-2022**

Semester : II

Class : I M.Sc Physics  
Sub. Code : 21PPE2A  
Title of the Paper: Instrumentation  
Total Hours : 75 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Oscilloscope</b> Introduction-Block Diagram of Oscilloscope - Simple CRO - Vertical Amplifier - Horizontal Deflecting System - Triggered Sweep CRO - Trigger Pulse Circuit - Delay Line in Triggered Sweep - Typical CRT Connections - High Frequency CRT - Dual Beam CRO -Measurement of Frequency by Lissajous Method	15	Chalk &Talk	 M.R.Gurulakshmi
July	II	<b>Signal Generators</b> Introduction - Variable AF Oscillator - Basic Standard Signal Generator-Modern Laboratory Signal Generator - AF Sine and Square Wave Generator - Function Generator - Square and Pulse Generator - Random Noise Generator - Video Pattern Generator - Color Bar Generator.	15	Chalk &Talk	 V.Radhajayalakshmi
August	III	<b>Measuring instruments</b> Introduction - Output Power Meters - Field Strength Meter - Stroboscope - Phase Meter -Q Meter. factors errors- impedance measurement - Susceptance method- RX Meters -Analog pH Meter.	15	Chalk & Talk	 M.R.Gurulakshmi
September	IV	<b>Recorders</b> Introduction - Strip Chart Recorder - Galvanometer Type Recorder - Null Type Recorder - Circular Chart Recorder - X-Y Recorder - Magnetic Recorders - Frequency Modulation Recording - Digital Data Recording.	15	Chalk & Talk	 V.Radhajayalakshmi
October	V	<b>Transducers</b> Introduction - Electrical Transducer - Selecting a Transducer - Resistive Transducer - Resistive Position Transducer - Resistive Thermometer - Thermistor -Piezo Electrical Transducer - Photo Electric Transducer.	15	Chalk & Talk	 M.R.Gurulakshmi  V.Radhajayalakshmi

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## LESSON PLAN

2021-2022

Class : I M.Sc Physics


Sub. Code : 21OPPNM2

Title of the Paper: Astronomy & Astrophysics

Total Hours : 30 Hours

Semester : II

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>History of astronomy</b> - Ancient Astronomy-Surya sidhanta-Modern Astronomy- Tycho Brahe- John Kepler- Galileo- Sir Isaac Newton - Edmund Halley- M.Leavitt	16	Chalk &Talk	R.Ariya Nachiar
July	II	<b>The earth</b> - The zones of earth- shape of the earth- radius of the earth- rotation of earth-Foucault's pendulum experiment-gyroscope experiment	16	Chalk &Talk	R.Ariya Nachiar
August	III	<b>The moon</b> - Introduction- phases of moon- successive phases of moon- lunar librations- summer and winter full moons- path of the moon with respect to the sun- Surface structure of the moon- The tides	16	Chalk & Talk	R.Ariya Nachiar
September	IV	<b>The solar system</b> -Introduction- The sun- Mercury- Venus- Mars- Jupiter- Saturn- Uranus-Neptune	16	Chalk & Talk	R.Ariya Nachiar
October	V	<b>The stellar universe And Stars</b> -Introduction- Stellar motion- Solar motion- Constellation- The milky way- survey of constellations-spring constellations-summer constellations - Distance of stars- Magnitude of stars- Absolute magnitudes- The colour and size of the stars- Star clusters.	16	Chalk & Talk	R.Ariya Nachiar

  
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**LESSON PLAN**  
**2021-2022**

Class : II M.Sc Physics

Sub. Code : 18PP41

Title of the Paper: Solid State Physics-II

Total Hours : 75 Hours

Semester :IV

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Superconductivity</b> Experimental survey- Occurrence and Destruction of Superconductivity - Meissner effect - Heat capacity-energy gap - Micro wave and infrared properties and isotope effect- Theoretical survey- London equation -BCS theory of superconductivity - Type II superconductors-High temperature superconducting (HTC) materials.	15	Chalk &Talk	 B. Subha
July	II	<b>Diamagnetism, Para magnetism</b> Langevin diamagnetism equation - Quantum theory of diamagnetism of mononuclear systems -Paramagnetism- Quantum theory of paramagnetism - Hund Rules- Spectroscopic splitting factor- Van Vleck temperature-independent paramagnetism - Cooling by isentropic demagnetization-Paramagnetism susceptibility of conduction electrons.	15	Chalk &Talk	 B. Subha
August	III	<b>Ferro and Anti Ferro magnetism</b> Ferromagnetic order-Curie point and the exchange integral - Magnons- Quantization of spin waves - Neutron magnetic scattering-Ferrimagnetic order- Curie temperature and susceptibility - Antiferromagnetic order- Susceptibility below the Neel temperature - Ferromagnetic Domains-Single domain particles.	15	Chalk & Talk	 S. Ameer Nisha Bibi
September	IV	<b>Plasmons, Polaritons and Polarons</b> Dielectric function of the electron gas -Plasmons- Electrostatic screening -Polaritons - Electron - Electron interaction - Electron - phonon interaction - Polarons - Peierls instability of linear- Metals. <b>Optical processes and Excitons</b> Optical reflectance - Kramers-Kronig relations - Exciton- Weakly bound excitons - Raman effect in crystals- Electron spectroscopy with X-rays - Energy loss of fast particles in a solid.	15	Chalk & Talk	 S. Ameer Nisha Bibi
October	V	<b>Point defects</b> Lattice vacancies - Schottky defects - Frenkel defects - Diffusion - metals - Color centers -F centers -Other centers in alkali halides. Dislocations-Shear strength of single crystals - Slip- Dislocations - Burgers vectors- Stress field of dislocations - Low-angle grain boundaries - dislocation densities - Strength of alloys- Dislocation and crystal growth- Hardness of materials	15	Chalk & Talk	 S. Ameer Nisha Bibi B. Subha

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**LESSON PLAN**  
**2021-2022**

Class : II M.Sc Physics

Sub. Code : 18PP42

Title of the Paper: Quantum Mechanics-II

Total Hours : 75 Hours

Semester :IV

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Time independent approximation:</b> Variation method- Expectation value of the energy- Application to excited states-Ground state of helium-Stationary perturbation theory-Non degenerate case-First order perturbation - second order perturbation -Perturbation of an oscillator-Zeeman effect without electron spin-First order stark effect in hydrogen.	15	Chalk &Talk	 R. Kayalvizhi
July	II	<b>Time dependent approximation:</b> Time-Dependent perturbation theory-First order perturbation-Harmonic perturbation-transition probability-second order perturbation-Adiabatic approximation - Sudden approximation.	15	Chalk &Talk	 R. Kayalvizhi
August	III	<b>Quantum theory of Scattering</b> 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 .	15	Chalk & Talk	 R. Kayalvizhi S. Manimozhi S. Manimozhi
September	IV	<b>Identical Particles and spin</b> Physical meaning of identity-Symmetric and Antisymmetric wave functions-Construction from unsymmetrized functions- The symmetric group-Distinguishability of identical particles-The exclusion principle-Connection with statistical mechanics - Connection between spin and statistics- Spin matrices and eigen functions-Collision of identical particles- Electron spin functions.	15	Chalk & Talk	 S. Manimozhi
October	V	<b>Relativistic Wave Equations</b> Schrodinger's Relativistic Equation-Free particle-Electromagnetic potentials-Separation of the equation -Energy levels in a coulomb field-Dirac's relativistic equation-Matrices-Free particle solutions-charge and current densities - Dirac's equation for a central field-Spin angular momentum - Spin orbit energy-Negative energy states.	15	Chalk & Talk	 S. Manimozhi

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## LESSON PLAN

2021-2022

Class : II M.Sc Physics

Semester : IV

Sub. Code : 18PP43

Title of the Paper: Molecular Spectroscopy

Total Hours : 75 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	<b>Microwave Spectroscopy</b> The Rotation of Molecules-Rotational Spectra – Diatomic Molecules – Polyatomic molecules – Techniques and Instrumentation – Chemical Analysis by Microwave Spectroscopy.	15	Chalk & Talk	 S. Priyanka
July	II	<b>Infrared Spectroscopy</b> The vibrating Diatomic molecule – The Diatomic vibrating Rotator- The vibration-Rotation spectrum of Carbon monoxide- Breakdown of the Born-Oppenheimer Approximation: The Interaction of Rotations and vibrations- The vibration of Polyatomic molecules- The Influence of Rotation on the spectra of Polyatomic molecules- Analysis by Infrared Techniques- Techniques and Instrumentation.	15	Chalk & Talk	 S. Manimozhi
August	III	<b>Raman Spectroscopy</b> Introduction – Pure Rotational Raman Spectra- Vibrational Raman spectra – Polarization of light and the Raman Effect – Structure Determination from Raman and infrared Spectroscopy-Techniques and Instrumentation – near Infrared FT Raman Spectroscopy.	15	Chalk & Talk	 S. Manimozhi
September	IV	<b>Electronic Spectroscopy of Molecules</b> Electronic Spectra of Diatomic molecules: The Born Oppenheimer Approximation – Vibrational coarse structure: Progressions-Intensity of Vibrational-Electronic Spectra; the Franck Condon Principle-Dissociation Energy and dissociation products – Rotational fine structure of electronic vibration transitions – the Fortrat diagram – Pre dissociation.	15	Chalk & Talk	 S. Priyanka
October	V	<b>Spin resonance Spectroscopy</b> Spin and an applied field – Nuclear magnetic resonance spectroscopy: Hydrogen nuclei - Nuclear magnetic resonance spectroscopy; other than Hydrogen nuclei Techniques and instrumentation.	15	Chalk & Talk	 S. Priyanka  S. Manimozhi

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**LESSON PLAN**  
**2021-2022**

Class : II M.Sc Physics

Semester : IV

Sub. Code : 18PPE4A

Title of the Paper: Microprocessor

Total Hours : 75 Hours

Month	Unit	Description of the Syllabus	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	The 8085 Programming model -8085 Hardware Model - 8085 programming model - Instruction Classification - the 8085 Instruction Set - Instruction, Data format and Storage - Instruction word size - Opcode Format - Data Format - How to write, Assembly, and Executive a simple program - Microprocessor architecture and its operations - Memory Classification.	15	Chalk &Talk	 M.R.Guru lakshmi
July	II	Data Transfer operations - Addressing modes -Data Transfer from register to output -Data transfer to control output devices - Arithmetic Operations -Addition - Addition and Increment - Subtraction - Subtraction of two unsigned numbers - Logic Operations -Logic AND -Data Masking with Logic AND - OR, Exclusive-OR and NOT- ORing Data from two Input Ports - Branch Operations-unconditional jump - conditional jumps - Writing Assembly Language Programs - debugging a program.	15	Chalk &Talk	 V. Radhajaya lakshmi
August	III	Counters and time delays -Time delay using One Register - Time delay using a Register pair - time delay using a loop with in a loop Technique - Counter design with time delay - Illustrative programs - Hexa decimal counters - 0 to 9 Counter - Generative pulse wave form - Debugging Counters and Time delay program -Stack - Subroutines.	15	Chalk & Talk	 M.R.Guru lakshmi
September	IV	BCD to Binary conversion -Binary to BCD conversion - BCD to seven segment - Binary-to-ASCII and ASCII -to -binary code conversion -BCD addition - BCD subtraction - Multiplication - Subtraction with carry- The 8085 interrupts-RST(Reset) Instruction-Multiple Interrupts and Priorities.	15	Chalk & Talk	 V. Radhajaya lakshmi
October	V	Micro architecture of the 8088/8086 Microprocessor - Memory address space & data organization - data types - Segment registers & memory segmentation - Dedicated, Reserved and General - Use Memory - Instruction pointer - Data Registers -Pointer and Index Registers - Status Register - Generating a memory address - The Stack	15	Chalk & Talk	 M.R.Guru lakshmi V. Radhajaya lakshmi

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