




Digambarrao Bindu Arts, Commerce & Science College, Bhokar, Dist Nanded

Department of Physics

Annual Teaching Plan for 2017-2018

Workload Distribution

Class	Teachers Name			
	Dr.Nemmaniwar B.G.		Mrs. Pawar S.A.	
	Theory	Practical	Theory	Practical
B.Sc. I Sem.-I	Paper-I	Paper-V	Paper-II	-----
B.Sc. I Sem.-II	Paper- IV		Paper-III	
B.Sc. II Sem.-III	Paper- VI	Paper- X & XI	Paper- VII	-----
B.Sc. II Sem.-IV	Paper- VIII		Paper- IX	
B.Sc. III Sem.-V	Paper-XII	Paper-XVI & XVII	Paper-XIII	-----
B.Sc. III Sem.-VI	Paper-XIV		Paper-XV	


Head
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Department of Physics
Digambarrao Bindu College, Bhokar,
Dist. Nanded.




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Bhokar, Ta. Bhokar Dist. Nanded



**DIGAMBARRAO BINDU ARTS & COMMERCE COLLEGE,
BHOKAR DIST. NANDED**

DEPARTMENT OF PHYSICS

Class: B.SC T.Y

Title of the Paper & No.: Quantum Mechanics, SSP, Atomic & Molecular Phy. & Digital & communication Electronics. XII, XIII-A, XIV, XV, XVI & XVII-A (Practicales). SEC III & IV

Name of the Teacher: Dr. Nemmaniwar B.G.

ANNUAL TEACHING PLAN 2017-18		
Month	Course content	Expected Periods
June	3 rd week colleges starts new academic year 2017-2018. at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. T.Y students. Unit I Particle Properties of Waves. Introduction, Photoelectric Effect	05
July	Quantum Theory of Light, The Compton Effect, de Broglie waves, Wave function, de Broglie Wave Velocity, Wave and Group velocities, G. P. Thomson experiment, The Uncertainty principle. Unit II Schrödinger's Equation Introduction, Schrödinger's Equation: Time dependent form, Probability current, Expectation Values, Operators, Schrödinger's Equation: Steady-state form, Eigen values and Eigen functions, Problems. And its applications. Unit I Crystal structure Introduction, Crystal Lattices and Translation vectors, Unit cell, Basis, Symmetry operations, Point groups, space group, Types of lattices, Simple crystal structure (HCP, FCC, BCC, SC), Structure of Diamond, NaCl, Problems. And assignment of two marks questions and answers writing for each papers as a best practices. To conduct first unit test on each unit. In second week introduce SEC III & IV. SEC III (A) Skill Enhancement Course: A. Renewable Energy and Harvesting. Unit 1 Fossil Fuels and Alternate Sources of Energy Fossil fuels and Nuclear Energy, Need of renewable energy, Non-conventional energy sources, Wind Energy, Tidal Energy, Solar Energy, Biomass Energy. Starts Practical's 1. Coefficient of viscosity by oscillating disc method 2. Determination of Rydberg's constant 3. Hartmann's dispersion formula 4. Temperature of flame 5. Cauchy's constant by using spectrometer 6. Conductivity by Forbe's method	14
Aug	Unit II Bonding in Solids and X-Ray Diffraction Inter atomic forces and types of bonding, ionic bond, covalent bond, metallic bond, hydrogen bond, Vander-waal's bond. X-ray diffraction, Bragg's law, Laue's method, Rotating crystal method Unit III Thermal properties of Solids Specific heat of gases, Specific heat of solids, Classical theory of Lattice heat Capacity, Einstein's theory of heat Capacity, Debye's theory of specific heat of solids, Limitations of Debye model. At last week to conduct first university internal exam Unit 2 Solar Energy and Harvesling	15


	<p>Importance, Storage of Solar Energy, Applications of Solar Energy, Solar Water Heater, Solar Distillation, Solar Cooker, Solar Green houses, Solar cell characteristics of Photovoltaic (pv) Systems.</p> <p>Practicals</p> <p>7. Determination of Planck constant (h) by photo cell.</p> <p>8. e / m by Thomson's method</p> <p>9. Determination of resolving power of prism</p> <p>10. Diffraction at Cylindrical Object: Determination of Wavelength</p> <p>11. Thermal conductivity of an insulator by Lee's disc method.</p>	
Sept	<p>Unit IV Free Electron Theory of Metals The outstanding properties of metals, Drude-Lorentz theory, Thermal conductivity, Electrical conductivity, Widemann-Franz relation, Sommerfeld Model, Electrical conductivity and Ohms law, Electronic specific heat, Thermoionic emission, escape of electrons from metal. Conduct third unit test on each unite.</p> <p>Unit III Applications of Quantum Mechanics Introduction, The particle in a box: energy quantization, The particle in a box: wave functions, The particle in a box: Momentum Quantization, The Harmonic Oscillator, The Harmonic Oscillator-Energy level, The particle in a three dimensional box</p> <p>Unit IV Quantum Theory of Hydrogen Atom Schrödinger's equation for the Hydrogen Atom in spherical polar co-ordinates, separation of Variables, Quantum numbers –Total quantum number, Orbital quantum number, Magnetic quantum number, spin quantum number At last week to conduct second university internal exam</p> <p>Unit 3 Wind Energy Harvesling Fundameials of Wind Energy, Wind Turbines and Different Electrical Machines in Wind Turbines, Power Electronic Interfaces and Grid Interconnection Technologies.</p> <p>12. Resolving power of grating</p> <p>13. Y By Konings Method</p> <p>14. To Study the Spectral Characteristics of a photovoltaic solar cell</p> <p>15. To determine the wavelength of H-alpha emission line in Hydrogen spectrum</p>	15
Oct	<p>Up to second week of this month one- one unit of each papers complete(unite fourth for each paper), and assigned best practices for students write two marks questions and answers writing for each papers. Completed 8-9 practical's of T.Y. conduct fourth unit test on each unit. And at third week university exams stars</p> <p>Unit 4 Ocean Energy Oscean Energy Potential against Wind and Solar Enevgy, Wave Energy Devices. Geothermal Energy Technologies, Hydropower Technologies</p> <p>Hands on Exercises:</p> <p>1. Studying basics of solar energy</p> <p>2. Assemble solar cooker</p> <p>3. Studying basics of solar electricity</p> <p>4. Installation of solar panels and solar energy harvesting</p> <p>5. Studying basics of Biomass Energy as an alternative source</p> <p>6. Generating electricity from wind energy and its storage</p> <p>7. Studying the construction and working of a solar lantern</p> <p>8. Designing and constructing photovoltaic system for a domestic house requiring 5kVA power</p> <p>9. Designing and constructing wind turbine system to power a house requiring 2kVA</p>	20
Nov	University exams of B.SC FY, SY & TY students and Diwali vacations	
Dec	<p>First week of this month starts lecturers on B.SC T.Y students Papers XIV & XV.</p> <p>Unit I Atomic Physics The Vector Atom Model, Quantum numbers associated with the vector atom model, LS and J-J coupling, The Pauli's exclusion Principle,</p>	14

	<p>Selection rules, Intensity rules, Interval rule, Normal Zeeman effect, Anomalous Zeeman effect, Stark effect.</p> <p>Unit II Molecular Spectra Regions of Electromagnetic Spectra, Classification of Molecular Spectra, Theory of pure rotational spectra, Theory of rotation-vibration spectra, Raman Effect, Experimental study,</p> <p>Unit I Number Systems Number System:- Decimal numbers, Binary numbers, Binary arithmetic, Ones complement representation, Twos complement representation, Octal Numbers, Hexadecimal numbers, Inter-conversions of number Systems, Binary coded decimal (BCD), Gray code, Excess-3 code. SEC</p> <p>IV (A) Skill Enhancement Course</p> <p>Unit I Semiconductor Diodes Construction, working and characteristics of different types of P-N junction diodes, Construction, working and characteristics of Zener diode, Construction, working and characteristics of Photo diode and Varactor diode.</p> <p>Unit II Field Effect Transistors Construction, working and characteristics of JFET, Construction, working and characteristics of MOSFET.</p> <p>Practical's</p> <ol style="list-style-type: none"> 1. To study the Hysteresis curve of the transformer core 2. Study of variation of thermo e.m.f. as a function of temperature 3. Study of CRO Measurement of frequency and voltage sensitivity 4. Determination of electrical conductivity of graphite rod 5. Determination of temperature coefficient of thermister 6. Study of energy band gap of a semiconductor 7. Determination of Planck constant (h) by LED 8. Comparison of capacity by Method of mixture <p>Assignment of two marks questions and answers writing for each paper as a best practices. To conduct first & second unit test on each unit.</p>	
Jan	<p>Unit II Logic Gates AND gate, OR gate, NOT gate, NAND gate, NOR gate, EX-OR and EX-NOR gates, Universal properties of NAND and NOR gates. Boolean operations, logic expressions for 2,3 & 4 inputs, laws of Boolean algebra, De -Morgen's theorems, SOP form of Boolean expressions, simplification of Boolean expressions using K- maps (up to 4variables), Half adder, Full adder</p> <p>Unit III Modulation and Demodulation Introduction, Types of Modulation, Expression for A. M. voltage, AM waves, Frequency spectrum of AM wave, Power Output in AM, Expression for frequency modulated voltage, Principle of Demodulation, linear diode AM detector or demodulator.</p> <p>Unit III Nuclear Fission and Nuclear Reactions Nuclear Fission, the fission products, energy release in fission, nuclear transmutation reactions, Conservation laws, Nuclear reaction kinematics</p> <p>SEC</p> <p>Unit III Rectifiers Block diagram of power supply, half wave rectifier, Full wave rectifier, ripple factor and efficiency of half and Full wave rectifiers</p> <p>Unit IV Thyristor and UJTs Construction, working and characteristics of SCR and Construction, working and characteristics of UJT.</p> <p>Practicals</p> <ol style="list-style-type: none"> 9. I-H curve by Magnetometer method 10. To measure resistivity of semiconductor by four probe method 11. Determination of crystal structure using Laue pattern 	15

	<p>12. Determination of crystal structure by rotating crystal method 13. Verification of truth table of basic gates (AND, OR, NOT) using ICs. 14. Construction of basic gates (AND, OR, NOT) using NAND gates 15. Construction of basic gates (AND, OR, NOT) using NOR gates 16. Construction and study of half adder using NAND gates. 17. Construction and study of full adder using NAND gates. Assignment of two marks questions and answers writing for each papers as a best practices. To conduct second, third & fourth unit test on each unit.</p>	
Feb	<p>Unit IV Nuclear Fusion and its applications Nuclear fusion, p-p chain reaction as the source of energy in the Sun like stars, thermal nuclear reactor, the neutron cycle, controlled and uncontrolled thermonuclear reactions. Unit IV Communication Electronics: Introduction, Block diagram of basic communication system, Essential elements of A.M. Transmitter.A.M. receiver,Turned Radio Frequency (TRF) Receiver, Super heterodyne receiver, Characteristics of radio receivers: sensitivity, selectivity, fidelity & their measurements. SEC Hands on Exercises: 1. Study and compare the V-I Characteristics of various types of P-N junction diodes (e.g. general purpose, LEDs, Zener Diode, etc.) 2. Study and compare the working of Photo diode and Varactor diode 3. Study and compare the working properties of the <i>n</i>-channel and <i>p</i>-channel JFETs 4. Study and compare the working properties of the <i>n</i>-channel and <i>p</i>-channel MOSFETs 5. Construct and test the performance of a FET Amplifier 6. Study the working of half wave rectifier and determine ripple factor for different R, L, C filters 7. Study the working of full wave rectifier and determine ripple factor for different R, L, C filters 8. Study of SCR characteristics 9. Study of UJT characteristics 10. Construct UJT based free running oscillator and change its frequency. 11. Construct a test circuit of SCR using UJT triggering Practicals 18. Implementation of Boolean expression from the given truth table using Kmap. 19. Study of Colpits oscillator 20. Study of Hartley Oscillator 21. Study of low pass and high pass filter using resistance and capacitance 22. Clipper and Clamper circuits 23. Study of A.M. Modulator 24. Study of A.M. Demodulator Assignment of two marks questions and answers writing for each papers as a best practices. To conduct fourth unit test on each unit.</p>	15
March	<p>Up to second week of this month one- one unit of each papers complete(unite fourth for each paper), and assigned best practices for students write two marks questions and answers writing for each papers. Completed 8-9 practicals of T.Y. conduct fourth unit test on each unite. And at third week university exams stars.</p>	20
April	<p>University exams of B.SC FY, SY & TY students.</p>	

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DEPARTMENT OF PHYSICS

Class: B.SC S.Y

Title of the Paper & No.: Waves and Oscillation & Optics & Laser. VI & VIII SEC I & II

Name of the Teacher: Dr. Nemmaniwar B.G.

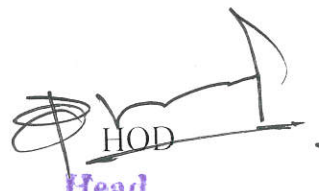
ANNUAL TEACHING PLAN 2017-18

Month	Course content	Expected Periods
June	3 rd week colleges starts new academic year 2017-2018, at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. S.Y students	04
July	Unit –I: Waves: Wave velocity and particle velocity, Differential equation of wave motion, Energy of a plane progressive wave, Equation of motion of a vibrating string, Velocity of transverse waves along a string, Frequency and period of vibration of a string, Skill Enhancement Course-I UNIT-I: Basic of Measurement: Instruments accuracy, Precision, Sensitivity, Resolution range, Errors in measurements, Loading effect. UNIT-II: Multimeter: Principle of measurement of dc voltage and dc current, ac voltage, ac current, Resistance, Specifications of a Multimeter and their Significance. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct first unit test.	16
Aug	Unit—II: Stationary waves: Analytical treatment of stationary waves (closed end & open end pipe at the other end), Investigation of pressure and density changes at displacement Nodes and Antinodes, Distribution of Energy in a stationary wave, Energy is not transferred in a stationary waves. UNIT-III: Voltmeter: Principles of voltage measurement (block diagram only), Sensitivity Specifications of an electronic voltmeter and its significance, Ac mill voltmeter, Types of ac mill voltmeter. UNIT-IV: Milliammeters: Principle of current measurement, Measurements of dc current, Ac current, Micro ammeters At last week to conduct first university internal exam, to assignment of MCQ questions and answers writing for each papers as a best practices. To conduct second unit test.	16
Sept	Unit - III: Free and Forced Vibrations: Free Vibrations, Forced Vibrations, Resonance, Oscillatory Motion of a particle from energy considerations, Damped simple harmonic motion, Aperiodic, Critically Damped Oscillatory Motions, Effect of damping on Frequency, Forced Vibrations, resonance and Sharpness of resonance. UNIT-V: Impedance Bridges: Block diagram of bridge, Working principles of basic (balancing type) RLC bridge, Specifications of RLC bridge. UNIT-VI: Digital Instruments: Principle and working of digital meters, Comparison of analogue and digital instruments, Characteristics of digital meter,	16

	<p>Working principle of digital voltmeter, Block diagram and working of digital Multimeter.</p> <p>At last week to conduct second university internal exam. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct third unit test.</p>	
Oct	<p>Unit –IV: Acoustics and Ultrasonics: Reverberation, Reverberation time, Derivation of Reverberation Time (Sabine’s formula), Absorption coefficient, Determination of absorption Coefficient (reverberation Chamber Method), Conditions for good acoustical designs of auditorium, Ultrasonics, Piezo-electric & magnetostriction effect, Piezoelectric Oscillator, magnetostriction oscillator, Detection of ultrasonic waves: Acoustic grating</p> <p>Hands on Exercises:</p> <ol style="list-style-type: none"> 1. Measurement of ac and dc voltages by using analogue multimeter. 2. Measurement of resistance using colour code and analogue multimeter. 3. Measurement of ac and dc currents by using multimeter. 4. Measurement of ac and dc voltages by using AC/DC Voltmeters. 5. Measurement of ac and dc currents by using AC/DC Milliammeters. 6. Determination of value of L and C using bridge circuit. 7. Measurement of ac and dc voltages by using digital multimeter. 8. Measurement of resistance using digital multimeter. 9. To study testing of diode and transistor with multimeter. <p>Conduct unit test. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct fourth unit test. And at third week university exams stars</p>	12
Nov	University exams of B.SC FY, SY & TY students and Diwali vacations	
Dec	<p>Unit-I: Geometrical Optics Cardinal Points of an Optical System(six points), Coaxial Lens System (equivalent focal length and cardinal points), Huygens Eyepiece, Ramsden Eyepiece and their cardinal points, In second week introduce SEC II</p> <p>UNIT-I: Refraction Through Lenses: Types of lenses, The sign convention, principal foci, Deviation produced by a thin lens, Power of a lens, Principal planes and focal planes, Dispersion by prism, Dispersive power, Huygens eyepiece, Ramsden eyepiece. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct first unit test.</p>	16
Jan	<p>Unit-II: Interference and Diffraction: Newton’s Rings, Determination of wavelength of Sodium light, Michelson Interferometer, Determination of wavelength of monochromatic light, Difference in wavelength between two neighboring spectral lines.</p> <p>Diffraction: Fresnel and Fraunhofer diffraction, Fraunhofer’s diffraction due to single and double slit, Plane diffraction grating, Determination of wavelength of Sodium light, Rayleigh criterion, Resolving Power of grating, Resolving power of Prism.</p> <p>UNIT-II: Semiconductor Sources and Detectors: Construction of LED, Working principle of LED, Types of LED, Construction of LDR, Working principle of LDR, Construction of photovoltaic cell & it’s working principle.</p> <p>Polarization of Light: Polarization of transverse wave, Plane of polarization, Brewster law, Malus law, specific rotation, Laurent’s half shade polarimeter</p> <p>At last week to conduct first university internal exam. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct second unit test.</p>	16
Feb	<p>Unit-III: Polarization of Light Polarization by Reflection, Brewster’s law, Malus law, Double refraction, Nicol</p>	16

	<p>prism, Nicol prism as an analyzer, Huygen's explanation of double Refraction in Uniaxial crystals, Quarter wave plate, Half wave plate, Optical Activity , Specific rotation, Laurent's half shade polarimeter.</p> <p>UNIT-III: Laser: Lasers, spontaneous and stimulated emission, Theory of laser action, Einstein's coefficients, Light amplification, Characterization of laser beam, He-Ne laser, Semiconductor lasers</p> <p>At last week to conduct second university internal exam. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct third unit test.</p>	
March	<p>Units-IV: Lasers Spontaneous & stimulated emission, absorption, Einstein coefficients (definitions), Population inversion, Optical & electrical pumping, Properties of lasers, He-Ne laser and diode Laser</p> <p>Hands on Exercises:</p> <ol style="list-style-type: none"> 1. Determination of focal length of a biconvex lens. 2. Determination of radius of curvature of a lens using a spherometer. 3. Determination of power of a lens. 4. Determination of the grating radial spacing of a compact disc (CD) by reflection using a laser source. 5. To find the width of the slit using diffraction pattern obtained by a laser. 6. To find angle of polarization using Brewster law. 7. To study V-I characteristics of LED. 8. Study the characteristics of solid state laser. 9. Study the characteristics of LDR. 10. Study characteristics of a photovoltaic cell. <p>Conduct fourth unit test. To assignment of MCQ questions and answers writing for each papers as a best practices. & at third week university exams stars</p>	12
April	University exams starts of B.SC FY, SY & TY students.	


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DEPARTMENT OF PHYSICS

Class: B.SC F.Y

Title of the Paper & No.: Mechanics & Properties of Matter, Electricity & Magnetism,
& Practical Paper I, IV & V

Name of the Teacher: Dr. Nemmaniwar B.G.

ANNUAL TEACHING PLAN 2017-18

Month	Course content	Expected Periods
June	Last week colleges starts new academic year 2017-2018, at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. F.Y students	03
July	<p>P-I Core Course: Mechanics and Properties of Matter</p> <p>Unit I: Mechanics Laws of Mechanics (Newton's Laws of Motion), Newton's Law of Gravitation, Kepler's Law of Planetary Motion, Gravitational Field, Gravitational Intensity, Gravitational Potential, Gravitational Potential energy, Conservation Law, Work, Power, Kinetic Energy (Work Energy Theorem), Conservation of energy for a particle energy function, Motion of a body near the surface of earth, Types of conservative and non- conservative forces</p> <p>(P-V) : Physics Practical Paper</p> <p>1. Y- by Spiral spring. 2. η - by Spiral spring. 3. η - by Static torsion. To assignment of MCQ questions and answers writing for papers as a best practices. To conduct first unit test.</p>	20
Aug	<p>Unit-II: Surface Tension Molecular Forces, Surface Tension & its explanation, Pressure difference across a curved surface, Expression for Excess Pressure inside a Spherical Drop and spherical Soap Bubble, Surface Tension by Jaeger's Method, Surface Tension by Ferguson Method.</p> <p>Practical Paper</p> <p>4. η - by Maxwell's needle. 5. Y- by bending loaded at the middle. 6. Viscosity of given liquid by Poiseuille's method. To assignment of MCQ questions and answers writing for papers as a best practices. To conduct second unit test. At last week to conduct first university internal exam</p>	12
Sept	<p>Unit- III: Viscosity Introduction, Coefficient of Viscosity, Streamline flow, critical velocity, Reynolds Number & its significance, Bernoullies Theorem, Poiseuille's equation</p>	12

	<p>for the flow of liquid through a tube, Experimental determination of coefficient viscosity by Poiseuille's Method.</p> <p>Practical Paper</p> <p>7. Surface Tension of liquid by Jaeger's method.</p> <p>8. Determination of Viscosity of given liquid by Searle's Viscometer.</p> <p>9. Field along the axis of Circular coil (Determination of radius of the coil)</p> <p>10. Small resistance by Carry Fosters Bridge.</p> <p>To assignment of MCQ questions and answers writing for papers as a best practices. To conduct third unit test. At last week to conduct second university internal exam</p>	
Oct	<p>Unit- IV: Elasticity</p> <p>Introduction, Hooke's Law, Elastic Constants (Y, K & η), Poisson's Ratio, Twisting couple on a cylinder or a (wire), Torsional pendulum, Bending of Beam, Bending Moment, Cantilever (Weight of the beam is ineffective, Weight of the beam is effective), Depression of a Beam supported at the ends and loaded at the Centre, Determination of Y by bending of beam. To assignment of MCQ questions and answers writing for papers as a best practices. To conduct fourth unit test. From third week university semester exams are starts</p>	10
Nov	University exams of B.SC FY, SY & TY students and Diwali vacations	
Dec	<p>P-IV Core Course: Electricity and Magnetism</p> <p>Unit-I: Alternating Current circuits</p> <p>Brief introduction to AC through Capacitor and Inductor, Nature of Impedance (Z) and Reactance (X) of Inductance (Z_L & X_L), Capacitance (Z_C & X_C) and Resistance (Z_R & X_R), Complex number and J-operator, Complex Impedance and reactance, Application of Complex numbers in solving AC Circuit (Not vector diagram), L-C-R (Series resonance and Parallel resonance) circuits. Power in AC circuit and Power Factor, Principle, working and types of transformers (step up and step down with figures), Current, voltage and turns ratio of transformer, Efficiency of transformer, AC bridges (Wheatstone bridge).</p> <p>Practical Paper</p> <p>11. Ballistic galvanometer (Figure of merit)</p> <p>12. Comparison of capacity by Desauty Method</p> <p>13. Determination of angle of Prism by Spectrometer</p> <p>To assignment of MCQ questions and answers writing for papers as a best practices. To conduct first unit test.</p>	12
Jan	<p>Unit- II: Magnetization</p> <p>Introduction, Magnetic Induction (B), Flux density, Intensity of magnetization (I), Intensity of magnetizing field (H) Permeability, Susceptibility, Relation between Permeability and Susceptibility, Hysteresis curve, Brief introduction of ferromagnetic, paramagnetic and diamagnetic phenomenon, I-H curve By magnetometer method, Principle and construction of Moving coil type Ballistic Galvanometer with theory (q).</p> <p>Practical Paper</p> <p>14 Determination of Refractive Index of Prism by Spectrometer</p> <p>15 Characteristics of P-N junction diode (forward and reverse)</p> <p>16. Zener Diode Characteristics</p> <p>To assignment of MCQ questions and answers writing for papers as a best practices. To conduct second unit test. At last week to conduct first university internal exam</p>	12
Feb	Unit- III: Electrostatics and Magnetostatics	12

	<p>Concept of electric field, electric flux, Gauss's law, conservative nature of electric field, concept of electric potential, potential energy of a system of charges, energy density in an electric field. Concept of Magnetic Field (B) and magnetic flux (Φ), Lorentz Force, Force on a current carrying conductor, Biot and Savert's Law, Applications of Biot-Savert's law to straight and circular current carrying conductor, Amperes circuital law (Integral form), Curl of magnetic field (Amperes circuital law differential form). Motion of charged particles in uniform electric field, Motion of charged particle in magnetic field, Maxwell's displacement current.</p> <p>To assignment of MCQ questions and answers writing for papers as a best practices. To conduct third unit test. At last week to conduct second university internal exam</p>	
March	<p>Unit- IV: Time Varying (Dynamic) Fields (Waves)</p> <p>Definition of electromagnetic induction, Faradays Law of Electromagnetic Induction, Lenz's law, Self induction, Self induction of a Solenoid, Mutual induction, Mutual Induction of a pair of coil, Work done in establishing current in an inductance, Mutual inductance of a Co axial solenoids, Problems.</p> <p>To assignment of MCQ questions and answers writing for papers as a best practices. To conduct fourth unit test. From third week university semester exams are starts</p>	10
April	University exams of B.SC FY, SY & TY students.	


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Department of Physics

Annual Teaching Plan for 2018-2019

Workload Distribution

Class	Teachers Name				
	Dr.Nemmaniwar B.G.		Mrs. Wagole M.G.(CHB)		Mr. Halge D.I.(CHB)
	Theory	Practical	Theory	Practical	Theory
B.Sc. I Sem.-I	Paper-I	Paper-V	Paper-II	-----	Paper- VI
B.Sc. I Sem.-II	Paper- IV		Paper-III		
B.Sc. II Sem.-III	-----	-----	Paper- VII	Paper- X & XI	Paper- IX
B.Sc. II Sem.-IV	Paper- VIII				
B.Sc. III Sem.-V	Paper-XII & XIII	Paper-XVI		Paper-XVII	
B.Sc. III Sem.-VI	Paper-XIV & XV				

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DEPARTMENT OF PHYSICS

Class: B.SC T.Y

Title of the Paper & No.: Quantum Mechanics, SSP, Atomic & Molecular Phy. & Digital & communication Electronics. XII, XIII-A, XIV, XV, XVI & XVII-A (Practicales). SEC III & IV

Name of the Teacher: Dr. Nemmaniwar B.G.

ANNUAL TEACHING PLAN 2018-19

Month	Course content	Expected Periods
June	3 rd week colleges starts new academic year 2018-2019, at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. T.Y students. Unit I Particle Properties of Waves. Introduction, Photoelectric Effect	05
July	Quantum Theory of Light, The Compton Effect, de Broglie waves, Wave function, de Broglie Wave Velocity, Wave and Group velocities, G. P. Thomson experiment, The Uncertainty principle. Unit II Schrödinger's Equation Introduction, Schrödinger's Equation: Time dependent form, Probability current, Expectation Values, Operators, Schrödinger's Equation: Steady-state form, Eigen values and Eigen functions, Problems. And its applications. Unit I Crystal structure Introduction, Crystal Lattices and Translation vectors, Unit cell, Basis, Symmetry operations, Point groups, space group, Types of lattices, Simple crystal structure (HCP, FCC, BCC, SC), Structure of Diamond, NaCl, Problems. And assignment of two marks questions and answers writing for each papers as a best practices. To conduct first unit test on each unit. In second week introduce SEC III & IV. SEC III (A) Skill Enhancement Course: A. Renewable Energy and Harvesting. Unit 1 Fossil Fuels and Alternate Sources of Energy Fossil fuels and Nuclear Energy, Need of renewable energy, Non-conventional energy sources, Wind Energy, Tidal Energy, Solar Energy, Biomass Energy. Starts Practical's 1. Coefficient of viscosity by oscillating disc method 2. Determination of Rydberg's constant 3. Hartmann's dispersion formula 4. Temperature of flame 5. Cauchy's constant by using spectrometer 6. Conductivity by Forbe's method	10
Aug	Unit II Bonding in Solids and X-Ray Diffraction Inter atomic forces and types of bonding, ionic bond, covalent bond, metallic bond, hydrogen bond, Vander-waal's bond. X-ray diffraction, Bragg's law, Laue's method, Rotating crystal method Unit III Thermal properties of Solids Specific heat of gases, Specific heat of solids, Classical theory of Lattice heat Capacity, Einstein's theory of heat Capacity, Debye's theory of specific heat of solids, Limitations of Debye model. At last week to conduct first university internal exam Unit 2 Solar Energy and Harvesling	10

	<p>Importance, Storage of Solar Energy, Applications of Solar Energy, Solar Water Heater, Solar Distillation, Solar Cooker, Solar Green houses, Solar cell characteristics of Photovoltaic (pv) Systems.</p> <p>Practicals</p> <p>7. Determination of Planck constant (h) by photo cell.</p> <p>8. e / m by Thomson's method</p> <p>9. Determination of resolving power of prism</p> <p>10. Diffraction at Cylindrical Object: Determination of Wavelength</p> <p>11. Thermal conductivity of an insulator by Lee's disc method.</p>	
Sept	<p>Unit IV Free Electron Theory of Metals The outstanding properties of metals, Drude-Lorentz theory, Thermal conductivity, Electrical conductivity, Widemann-Franz relation, Sommerfeld Model, Electrical conductivity and Ohms law, Electronic specific heat, Thermoionic emission, escape of electrons from metal. Conduct third unit test on each unite.</p> <p>Unit III Applications of Quantum Mechanics Introduction, The particle in a box: energy quantization, The particle in a box: wave functions, The particle in a box: Momentum Quantization, The Harmonic Oscillator, The Harmonic Oscillator-Energy level, The particle in a three dimensional box</p> <p>Unit IV Quantum Theory of Hydrogen Atom Schrödinger's equation for the Hydrogen Atom in spherical polar co-ordinates, separation of Variables, Quantum numbers –Total quantum number, Orbital quantum number, Magnetic quantum number, spin quantum number At last week to conduct second university internal exam</p> <p>Unit 3 Wind Energy Harvesling Fundameials of Wind Energy, Wind Turbines and Different Electrical Machines in Wind Turbines, Power Electronic Interfaces and Grid Interconnection Technologies.</p> <p>12. Resolving power of grating</p> <p>13. Y By Konings Method</p> <p>14. To Study the Spectral Characteristics of a photovoltaic solar cell</p> <p>15. To determine the wavelength of H-alpha emission line in Hydrogen spectrum</p>	45
Oct	<p>Up to second week of this month one- one unit of each papers complete(unite fourth for each paper), and assigned best practices for students write two marks questions and answers writing for each papers. Completed 8-9 practical's of T.Y. conduct fourth unit test on each unit. And at third week university exams stars</p> <p>Unit 4 Ocean Energy Oscean Energy Potential against Wind and Solar Enevgy, Wave Energy Devices. Geothermal Energy Technologies, Hydropower Technologies</p> <p>Hands on Exercises:</p> <p>1. Studying basics of solar energy</p> <p>2. Assemble solar cooker</p> <p>3. Studying basics of solar electricity</p> <p>4. Installation of solar panels and solar energy harvesting</p> <p>5. Studying basics of Biomass Energy as an alternative source</p> <p>6. Generating electricity from wind energy and its storage</p> <p>7. Studying the construction and working of a solar lantern</p> <p>8. Designing and constructing photovoltaic system for a domestic house requiring 5kVA power</p> <p>9. Designing and constructing wind turbine system to power a house requiring 2kVA</p>	20
Nov	University exams of B.SC FY, SY & TY students and Diwali vacations	
Dec	<p>First week of this month starts lecturers on B.SC T.Y students Papers XIV & XV.</p> <p>Unit I Atomic Physics The Vector Atom Model, Quantum numbers associated with the vector atom model, LS and J-J coupling, The Pauli's exclusion Principle,</p>	14

	<p>Selection rules, Intensity rules, Interval rule, Normal Zeeman effect, Anomalous Zeeman effect, Stark effect.</p> <p>Unit II Molecular Spectra Regions of Electromagnetic Spectra, Classification of Molecular Spectra, Theory of pure rotational spectra, Theory of rotation-vibration spectra, Raman Effect, Experimental study,</p> <p>Unit I Number Systems Number System:- Decimal numbers, Binary numbers, Binary arithmetic, Ones complement representation, Twos complement representation, Octal Numbers, Hexadecimal numbers, Inter-conversions of number Systems, Binary coded decimal (BCD), Gray code, Excess-3 code. SEC</p> <p>IV (A) Skill Enhancement Course</p> <p>Unit I Semiconductor Diodes Construction, working and characteristics of different types of P-N junction diodes, Construction, working and characteristics of Zener diode, Construction, working and characteristics of Photo diode and Varactor diode.</p> <p>Unit II Field Effect Transistors Construction, working and characteristics of JFET, Construction, working and characteristics of MOSFET.</p> <p>Practical's</p> <ol style="list-style-type: none"> 1. To study the Hysteresis curve of the transformer core 2. Study of variation of thermo e.m.f. as a function of temperature 3. Study of CRO Measurement of frequency and voltage sensitivity 4. Determination of electrical conductivity of graphite rod 5. Determination of temperature coefficient of thermister 6. Study of energy band gap of a semiconductor 7. Determination of Planck constant (h) by LED 8. Comparison of capacity by Method of mixture <p>Assignment of two marks questions and answers writing for each paper as a best practices. To conduct first & second unit test on each unit.</p>	
Jan	<p>Unit II Logic Gates AND gate, OR gate, NOT gate, NAND gate, NOR gate, EX-OR and EX-NOR gates, Universal properties of NAND and NOR gates. Boolean operations, logic expressions for 2,3 & 4 inputs, laws of Boolean algebra, De -Morgan's theorems, SOP form of Boolean expressions, simplification of Boolean expressions using K- maps (up to 4variables), Half adder, Full adder</p> <p>Unit III Modulation and Demodulation Introduction, Types of Modulation, Expression for A. M. voltage, AM waves, Frequency spectrum of AM wave, Power Output in AM, Expression for frequency modulated voltage, Principle of Demodulation, linear diode AM detector or demodulator.</p> <p>Unit III Nuclear Fission and Nuclear Reactions Nuclear Fission, the fission products, energy release in fission, nuclear transmutation reactions, Conservation laws, Nuclear reaction kinematics</p> <p>SEC</p> <p>Unit III Rectifiers Block diagram of power supply, half wave rectifier, Full wave rectifier, ripple factor and efficiency of half and Full wave rectifiers</p> <p>Unit IV Thyristor and UJTs Construction, working and characteristics of SCR and Construction, working and characteristics of UJT.</p> <p>Practicals</p> <ol style="list-style-type: none"> 9. I-H curve by Magnetometer method 10. To measure resistivity of semiconductor by four probe method 11. Determination of crystal structure using Laue pattern 	15

	<p>12. Determination of crystal structure by rotating crystal method 13. Verification of truth table of basic gates (AND, OR, NOT) using ICs. 14. Construction of basic gates (AND, OR, NOT) using NAND gates 15. Construction of basic gates (AND, OR, NOT) using NOR gates 16. Construction and study of half adder using NAND gates. 17. Construction and study of full adder using NAND gates. Assignment of two marks questions and answers writing for each papers as a best practices. To conduct second, third & fourth unit test on each unit.</p>	
Feb	<p>Unit IV Nuclear Fusion and its applications Nuclear fusion, p-p chain reaction as the source of energy in the Sun like stars, thermal nuclear reactor, the neutron cycle, controlled and uncontrolled thermonuclear reactions.</p> <p>Unit IV Communication Electronics: Introduction, Block diagram of basic communication system, Essential elements of A.M. Transmitter.A.M. receiver, Turned Radio Frequency (TRF) Receiver, Super heterodyne receiver, Characteristics of radio receivers: sensitivity, selectivity, fidelity & their measurements.</p> <p>SEC Hands on Exercises: 1. Study and compare the V-I Characteristics of various types of P-N junction diodes (e.g. general purpose, LEDs, Zener Diode, etc.) 2. Study and compare the working of Photo diode and Varactor diode 3. Study and compare the working properties of the <i>n</i>-channel and <i>p</i>-channel JFETs 4. Study and compare the working properties of the <i>n</i>-channel and <i>p</i>-channel MOSFETs 5. Construct and test the performance of a FET Amplifier 6. Study the working of half wave rectifier and determine ripple factor for different R, L, C filters 7. Study the working of full wave rectifier and determine ripple factor for different R, L, C filters 8. Study of SCR characteristics 9. Study of UJT characteristics 10. Construct UJT based free running oscillator and change its frequency. 11. Construct a test circuit of SCR using UJT triggering</p> <p>Practicals 18. Implementation of Boolean expression from the given truth table using Kmap. 19. Study of Colpits oscillator 20. Study of Hartley Oscillator 21. Study of low pass and high pass filter using resistance and capacitance 22. Clipper and Clamper circuits 23. Study of A.M. Modulator 24. Study of A.M. Demodulator Assignment of two marks questions and answers writing for each papers as a best practices. To conduct fourth unit test on each unit.</p>	150
March	<p>Up to second week of this month one- one unit of each papers complete(unite fourth for each paper), and assigned best practices for students write two marks questions and answers writing for each papers. Completed 8-9 practicals of T.Y. conduct fourth unit test on each unite. And at third week university exams stars.</p>	20
April	<p>University exams of B.SC FY, SY & TY students.</p>	

Department of PHYSICS

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Annual Teaching plan 2018-19



DIGAMBARRAO BINDU ARTS & COMMERCE COLLEGE,
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DEPARTMENT OF PHYSICS

Class: B.SC S.Y

Title of the Paper & No.: Waves and Oscillation & Optics & Laser. VI & VIII SEC I & II

Name of the Teacher: Dr. Nemmaniwar B.G.

ANNUAL TEACHING PLAN 2018-19

Month	Course content	Expected Periods
June	3 rd week colleges starts new academic year 2018-2019, at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. S.Y students	04
July	Unit –I: Waves: Wave velocity and particle velocity, Differential equation of wave motion, Energy of a plane progressive wave, Equation of motion of a vibrating string, Velocity of transverse waves along a string, Frequency and period of vibration of a string, Skill Enhancement Course-I UNIT-I: Basic of Measurement: Instruments accuracy, Precision, Sensitivity, Resolution range, Errors in measurements, Loading effect. UNIT-II: Multimeter: Principle of measurement of dc voltage and dc current, ac voltage, ac current, Resistance, Specifications of a Multimeter and their Significance. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct first unit test.	16
Aug	Unit—II: Stationary waves: Analytical treatment of stationary waves (closed end & open end pipe at the other end), Investigation of pressure and density changes at displacement Nodes and Antinodes, Distribution of Energy in a stationary wave, Energy is not transferred in a stationary waves. UNIT-III: Voltmeter: Principles of voltage measurement (block diagram only), Sensitivity Specifications of an electronic voltmeter and its significance, Ac mill voltmeter, Types of ac mill voltmeter. UNIT-IV: Milliammeters: Principle of current measurement, Measurements of dc current, Ac current, Micro ammeters At last week to conduct first university internal exam, to assignment of MCQ questions and answers writing for each papers as a best practices. To conduct second unit test.	16
Sept	Unit - III: Free and Forced Vibrations: Free Vibrations, Forced Vibrations, Resonance, Oscillatory Motion of a particle from energy considerations, Damped simple harmonic motion, Aperiodic, Critically Damped Oscillatory Motions, Effect of damping on Frequency, Forced Vibrations, resonance and Sharpness of resonance. UNIT-V: Impedance Bridges: Block diagram of bridge, Working principles of basic (balancing type) RLC bridge. Specifications of RLC bridge. UNIT-VI: Digital Instruments: Principle and working of digital meters, Comparison of analogue and digital instruments, Characteristics of digital meter.	16

Principal

Faculty IN-Charge

	<p>Working principle of digital voltmeter,Block diagram and working of digital Multimeter.</p> <p>At last week to conduct second university internal exam. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct third unit test.</p>	
Oct	<p>Unit –IV: Acoustics and Ultrasonics: Reverberation, Reverberation time, Derivation of Reverberation Time (Sabine’s formula), Absorption coefficient, Determination of absorption Coefficient (reverberation Chamber Method), Conditions for good acoustical designs of auditorium, Ultrasonics,Piezo-electric & magnetostriction effect, Piezoelectric Oscillator. magnetostriction oscillator, Detection of ultrasonic waves: Acoustic grating</p> <p>Hands on Exercises:</p> <ol style="list-style-type: none"> 1. Measurement of ac and dc voltages by using analogue multimeter. 2. Measurement of resistance using colour code and analogue multimeter. 3. Measurement of ac and dc currents by using multimeter. 4. Measurement of ac and dc voltages by using AC/DC Voltmeters. 5. Measurement of ac and dc currents by using AC/DC Milliammeters. 6. Determination of value of L and C using bridge circuit. 7. Measurement of ac and dc voltages by using digital multimeter. 8. Measurement of resistance using digital multimeter. 9. To study testing of diode and transistor with multimeter. <p>Conduct unit test. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct fourth unit test. And at third week university exams stars</p>	12
Nov	<p>University exams of B.SC FY, SY & TY students and Diwali vacations</p>	
Dec	<p>Unit–I: Geometrical Optics Cardinal Points of an Optical System(six points), Coaxial Lens System (equivalent focal length and cardinal points), Huygens Eyepiece, Ramsden Eyepiece and their cardinal points, In second week introduce SEC II</p> <p>UNIT-I: Refraction Through Lenses: Types of lenses, The sign convention, principal foci, Deviation produced by a thin lens, Power of a lens, Principal planes and focal planes, Dispersion by prism, Dispersive power, Huygens eyepiece, Ramsden eyepiece.To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct first unit test.</p>	16
Jan	<p>Unit–II: Interference and Diffraction: Newton’s Rings, Determination of wavelength of Sodium light, Michelson Interferometer, Determination of wavelength of monochromatic light, Difference in wavelength between two neighboring spectral lines.</p> <p>Diffraction: Fresnel and Fraunhofer diffraction, Fraunhofer’s diffraction due to single and double slit, Plane diffraction grating, Determination of wavelength of Sodium light, Rayleigh criterion, Resolving Power of grating, Resolving power of Prism.</p> <p>UNIT-II: Semiconductor Sources and Detectors: Construction of LED, Working principle of LED, Types of LED, Construction of LDR, Working principle of LDR, Construction of photovoltaic cell & it’s working principle.</p> <p>Polarization of Light: Polarization of transverse wave, Plane of polarization, Brewster law, Malus law, specific rotation, Laurent’s half shade polarimeter</p> <p>At last week to conduct first university internal exam. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct second unit test.</p>	16
Feb	<p>Unit–III: Polarization of Light Polarization by Reflection, Brewster’s law, Malus law, Double refraction, Nicol</p>	16

	<p>prism, Nicol prism as an analyzer, Huygen's explanation of double Refraction in Uniaxial crystals, Quarter wave plate, Half wave plate, Optical Activity , Specific rotation, Laurent's half shade polarimeter.</p> <p>UNIT-III: Laser: Lasers, spontaneous and stimulated emission, Theory of laser action, Einstein's coefficients, Light amplification, Characterization of laser beam, He-Ne laser, Semiconductor lasers</p> <p>At last week to conduct second university internal exam. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct third unit test.</p>	
March	<p>Units-IV: Lasers Spontaneous & stimulated emission, absorption, Einstein coefficients (definitions), Population inversion, Optical & electrical pumping, Properties of lasers, He-Ne laser and diode Laser</p> <p>Hands on Exercises:</p> <ol style="list-style-type: none"> 1. Determination of focal length of a biconvex lens. 2. Determination of radius of curvature of a lens using a spherometer. 3. Determination of power of a lens. 4. Determination of the grating radial spacing of a compact disc (CD) by reflection using a laser source. 5. To find the width of the slit using diffraction pattern obtained by a laser. 6. To find angle of polarization using Brewster law. 7. To study V-I characteristics of LED. 8. Study the characteristics of solid state laser. 9. Study the characteristics of LDR. 10. Study characteristics of a photovoltaic cell. <p>Conduct fourth unit test. To assignment of MCQ questions and answers writing for each papers as a best practices. & at third week university exams stars</p>	12
April	University exams starts of B.SC FY, SY & TY students.	

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DEPARTMENT OF PHYSICS

Class: B.SC F.Y

**Title of the Paper & No.: Mechanics & Properties of Matter, Electricity & Magnetism.
& Practical Paper I, IV & V**


Name of the Teacher: Dr. Nemmaniwar B.G.

ANNUAL TEACHING PLAN 2018-19		
Month	Course content	Expected Periods
June	Last week colleges starts new academic year 2018-2019, at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. F.Y students	03
July	<p>P-I Core Course: Mechanics and Properties of Matter</p> <p>Unit I: Mechanics Laws of Mechanics (Newton's Laws of Motion), Newton's Law of Gravitation, Kepler's Law of Planetary Motion, Gravitational Field, Gravitational Intensity, Gravitational Potential, Gravitational Potential energy, Conservation Law, Work, Power, Kinetic Energy (Work Energy Theorem), Conservation of energy for a particle energy function, Motion of a body near the surface of earth, Types of conservative and non- conservative forces</p> <p>(P-V) : Physics Practical Paper</p> <p>1. Y- by Spiral spring. 2. η - by Spiral spring. 3. η - by Static torsion. To assignment of MCQ questions and answers writing for papers as a best practices. To conduct first unit test.</p>	20
Aug	<p>Unit-II: Surface Tension Molecular Forces, Surface Tension & its explanation, Pressure difference across a curved surface, Expression for Excess Pressure inside a Spherical Drop and spherical Soap Bubble, Surface Tension by Jaeger's Method, Surface Tension by Ferguson Method.</p> <p>Practical Paper</p> <p>4. η - by Maxwell's needle. 5. Y- by bending loaded at the middle. 6. Viscosity of given liquid by Poiseuille's method. To assignment of MCQ questions and answers writing for papers as a best practices. To conduct second unit test. At last week to conduct first university internal exam</p>	10
Sept	<p>Unit- III: Viscosity Introduction, Coefficient of Viscosity, Streamline flow, critical velocity, Reynolds Number & its significance, Bernoullies Theorem, Poiseuille's equation</p>	10

	<p>for the flow of liquid through a tube, Experimental determination of coefficient viscosity by Poiseuille's Method.</p> <p>Practical Paper</p> <p>7. Surface Tension of liquid by Jaeger's method. 8. Determination of Viscosity of given liquid by Searle's Viscometer. 9. Field along the axis of Circular coil (Determination of radius of the coil) 10. Small resistance by Carry Fosters Bridge.</p> <p>To assignment of MCQ questions and answers writing for papers as a best practices. To conduct third unit test. At last week to conduct second university internal exam</p>	
Oct	<p>Unit- IV: Elasticity Introduction, Hooke's Law, Elastic Constants (Y, K & η), Poisson's Ratio, Twisting couple on a cylinder or a (wire), Torsional pendulum, Bending of Beam, Bending Moment, Cantilever (Weight of the beam is ineffective, Weight of the beam is effective), Depression of a Beam supported at the ends and loaded at the Centre, Determination of Y by bending of beam. To assignment of MCQ questions and answers writing for papers as a best practices. To conduct fourth unit test. From third week university semester exams are starts</p>	10
Nov	University exams of B.SC FY, SY & TY students and Diwali vacations	
Dec	<p>P-IV Core Course: Electricity and Magnetism</p> <p>Unit-I: Alternating Current circuits Brief introduction to AC through Capacitor and Inductor, Nature of Impedance (z) and Reactance (x) of Inductance (z_L & x_L), Capacitance (z_C & x_C) and Resistance (z_R & x_R), Complex number and J-operator, Complex Impedance and reactance, Application of Complex numbers in solving AC Circuit (Not vector diagram), L-C-R (Series resonance and Parallel resonance) circuits. Power in AC circuit and Power Factor, Principle, working and types of transformers (step up and step down with figures), Current, voltage and turns ratio of transformer, Efficiency of transformer, AC bridges (Wheatstone bridge).</p> <p>Practical Paper</p> <p>11. Ballistic galvanometer (Figure of merit) 12. Comparison of capacity by Desauty Method 13. Determination of angle of Prism by Spectrometer</p> <p>To assignment of MCQ questions and answers writing for papers as a best practices. To conduct first unit test.</p>	10
Jan	<p>Unit- II: Magnetization Introduction, Magnetic Induction (B), Flux density, Intensity of magnetization (I), Intensity of magnetizing field (H) Permeability, Susceptibility, Relation between Permeability and Susceptibility, Hysteresis curve, Brief introduction of ferromagnetic, paramagnetic and diamagnetic phenomenon, I-H curve By magnetometer method, Principle and construction of Moving coil type Ballistic Galvanometer with theory (q).</p> <p>Practical Paper</p> <p>14 Determination of Refractive Index of Prism by Spectrometer 15 Characteristics of P-N junction diode (forward and reverse) 16. Zener Diode Characteristics</p> <p>To assignment of MCQ questions and answers writing for papers as a best practices. To conduct second unit test. At last week to conduct first university internal exam</p>	10
Feb	Unit- III: Electrostatics and Magnetostatics	10

	<p>Concept of electric field, electric flux, Gauss's law, conservative nature of electric field, concept of electric potential, potential energy of a system of charges, energy density in an electric field. Concept of Magnetic Field (B) and magnetic flux (Φ), Lorentz Force, Force on a current carrying conductor, Biot and Savart's Law, Applications of Biot-Savart's law to straight and circular current carrying conductor, Amperes circuital law (Integral form), Curl of magnetic field (Ampere's circuital law differential form). Motion of charged particles in uniform electric field, Motion of charged particle in magnetic field, Maxwell's displacement current.</p> <p>To assignment of MCQ questions and answers writing for papers as a best practices. To conduct third unit test. At last week to conduct second university internal exam</p>	
March	<p>Unit- IV: Time Varying (Dynamic) Fields (Waves)</p> <p>Definition of electromagnetic induction, Faraday's Law of Electromagnetic Induction, Lenz's law, Self induction, Self induction of a Solenoid, Mutual induction, Mutual Induction of a pair of coil, Work done in establishing current in an inductance, Mutual inductance of a Co axial solenoids, Problems.</p> <p>To assignment of MCQ questions and answers writing for papers as a best practices. To conduct fourth unit test. From third week university semester exams are starts</p>	10
April	University exams of B.SC FY, SY & TY students.	


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Department of Physics

Annual Teaching Plan for 2019-2020

Workload Distribution

Class	Teachers Name					
	Dr.Nemmaniwar B.G.		Mrs. Wagole M.G.(CHB)		Miss. Ghan V.W.(CHB)	
	Theory	Practical	Theory	Practical	Theory	Practical
B.Sc. I Sem.-I	Paper-I & II	Paper-V		-----	Paper-II (Two Units)	
B.Sc. I Sem.-II	Paper-III & IV				Paper- III (Two Units)	
B.Sc. II Sem.-III	Paper- VII	-----	Paper- VII (Two Units)	Paper- X		
B.Sc. II Sem.-IV	Paper- VIII		Paper VIII (Two units)	Paper-XI		
B.Sc. III Sem.-V	Paper-XII & XIII	Paper- XVI	-----			-----
B.Sc. III Sem.-VI	Paper-XIV & XV		-----			Paper-XVII


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DEPARTMENT OF PHYSICS

Class: B.SC T.Y

Title of the Paper & No.: Quantum Mechanics and Atomic & Molecular Phy. XII and XIV XVI (Practicales). SEC III & IV

Name of the Teacher: Dr. Nemmaniwar B.G.

ANNUAL TEACHING PLAN 2019-20

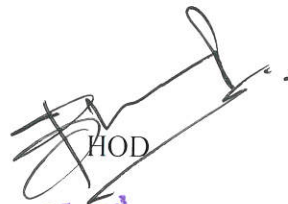
Month	Course content	Expected Periods
June 2019	3 rd week colleges starts new academic year 2019-2020, at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. T.Y students. Unit I Particle Properties of Waves. Introduction, Photoelectric Effect	05
July 2019	Quantum Theory of Light, The Compton Effect, de Broglie waves, Wave function, de Broglie Wave Velocity, Wave and Group velocities, G. P. Thomson experiment, The Uncertainty principle. Unit II Schrödinger's Equation Introduction, Schrödinger's Equation: Time dependent form, Probability current, Expectation Values, Operators, Schrödinger's Equation: Steady-state form, Eigen values and Eigen functions, Problems. And its applications. SEC III (A) Skill Enhancement Course: A. Renewable Energy and Harvesting. Unit 1 Fossil Fuels and Alternate Sources of Energy Fossil fuels and Nuclear Energy, Need of renewable energy, Non-conventional energy sources, Wind Energy, Tidal Energy, Solar Energy, Biomass Energy. Starts Practical's 1. Coefficient of viscosity by oscillating disc method 2. Determination of Rydberg's constant 3. Hartmann's dispersion formula 4. Temperature of flame 5. Cauchy's constant by using spectrometer 6. Conductivity by Forbe's method	12
Aug 2019	Unit III Applications of Quantum Mechanics Introduction, The particle in a box: energy quantization, The particle in a box: wave functions, The particle in a box: Momentum Quantization, The Harmonic Oscillator, The Harmonic Oscillator-Energy level, The particle in a three dimensional box Unit 2 Solar Energy and Harvesling Importance, Storage of Solar Energy, Applications of Solar Energy, Solar Water Heater, Solar Distillation, Solar Cooker, Solar Green houses, Solar cell characteristics of Photovoltaic (pv) Systems. Practicals 7. Determination of Planck constant (h) by photo cell. 8. e/m by Thomson's method 9. Determination of resolving power of prism 10. Diffraction at Cylindrical Object: Determination of Wavelength 11. Thermal conductivity of an insulator by Lee's disc method.	14
Sept	Unit IV Quantum Theory of Hydrogen Atom Schrödinger's equation for the	12

2019	<p>Hydrogen Atom in spherical polar co-ordinates, separation of Variables, Quantum numbers – Total quantum number, Orbital quantum number, Magnetic quantum number, spin quantum number At last week to conduct second university internal exam</p> <p>Unit 3 Wind Energy Harvesling Fundameials of Wind Energy, Wind Turbines and Different Electrical Machines in Wind Turbines, Power Electronic Interfaces and Grid Interconnection Technologies.</p> <p>12. Resolving power of grating 13. Y By Konings Method 14. To Study the Spectral Characteristics of a photovoltaic solar cell 15. To determine the wavelength of H-alpha emission line in Hydrogen spectrum</p>	
Oct 2019	<p>Up to second week of this month one- one unit of each papers complete(unite fourth for each paper), and assigned best practices for students write two marks questions and answers writing for each papers. Completed 8-9 practical's of T.Y. conduct fourth unit test on each unit. And at third week university exams stars</p> <p>Unit 4 Ocean Energy Oscean Enersy Potential against Wind and Solar Enevgy, Wave Energy Devices. Geothermal Energy Technologies, Hydropower Technologies</p> <p>Hands on Exercises:</p> <ol style="list-style-type: none"> 1. Studying basics of solar energy 2. Assemble solar cooker 3. Studying basics of solar electricity 4. Installation of solar panels and solar energy harvesting 5. Studying basics of Biomass Energy as an alternative source 6. Generating electricity from wind energy and its storage 7. Studying the construction and working of a solar lantern 8. Designing and constructing photovoltaic system for a domestic house requiring 5kVA power 9. Designing and constructing wind turbine system to power a house requiring 2kVA 	15
Nov 2019	University exams of B.SC TY students and Diwali vacations	
Dec 2019	<p>First week of this month starts lecturers on B.SC T.Y students Papers XIV & XV.</p> <p>Unit I Atomic Physics The Vector Atom Model, Quantum numbers associated with the vector atom model, LS and J-J coupling, The Pauli's exclusion Principle, Selection rules, Intensity rules, Interval rule, Normal Zeeman effect, Anomalous Zeeman effect, Stark effect.</p> <p>Unit II Molecular Spectra Regions of Electromagnetic Spectra, Classification of Molecular Spectra, Theory of pure rotational spectra, Theory of rotation-vibration spectra, Raman Effect, Experimental study,</p> <p>SEC IV (A) Skill Enhancement Course</p> <p>Unit I Semiconductor Diodes Construction, working and characteristics of different types of P-N junction diodes, Construction, working and characteristics of Zener diode, Construction, working and characteristics of Photo diode and Varactor diode.</p> <p>Unit II Field Effect Transistors Construction, working and characteristics of JFET, Construction, working and characteristics of MOSFET.</p> <p>Practical's</p> <ol style="list-style-type: none"> 1. To study the Hysteresis curve of the transformer core 2. Study of variation of thermo e.m.f. as a function of temperature 3. Study of CRO Measurement of frequency and voltage sensitivity 4. Determination of electrical conductivity of graphite rod 	14

	<p>5. Determination of temperature coefficient of thermister</p> <p>6. Study of energy band gap of a semiconductor</p> <p>7. Determination of Planck constant (h) by LED</p> <p>8. Comparison of capacity by Method of mixture</p> <p>Assignment of two marks questions and answers writing for each paper as a best practices. To conduct first & second unit test on each unit.</p>	
Jan 2020	<p>Unit III Nuclear Fission and Nuclear Reactions Nuclear Fission, the fission products, energy release in fission, nuclear transmutation reactions, Conservation laws, Nuclear reaction kinematics</p> <p>SEC</p> <p>Unit III Rectifiers Block diagram of power supply, half wave rectifier, Full wave rectifier, ripple factor and efficiency of half and Full wave rectifiers</p> <p>Unit IV Thyristor and UJTs Construction, working and characteristics of SCR and Construction, working and characteristics of UJT.</p> <p>Practicals</p> <p>9. I-H curve by Magnetometer method</p> <p>10. To measure resistivity of semiconductor by four probe method</p> <p>11. Determination of crystal structure using Laue pattern</p> <p>12. Determination of crystal structure by rotating crystal method</p> <p>13. Verification of truth table of basic gates (AND, OR, NOT) using ICs.</p> <p>14. Construction of basic gates (AND, OR, NOT) using NAND gates</p> <p>15. Construction of basic gates (AND, OR, NOT) using NOR gates</p> <p>16. Construction and study of half adder using NAND gates.</p> <p>17. Construction and study of full adder using NAND gates.</p> <p>Assignment of two marks questions and answers writing for each papers as a best practices. To conduct second, third & fourth unit test on each unit.</p>	12
Feb 2020	<p>Unit IV Nuclear Fusion and its applications Nuclear fusion, p-p chain reaction as the source of energy in the Sun like stars, thermal nuclear reactor, the neutron cycle, controlled and uncontrolled thermonuclear reactions.</p> <p>SEC Hands on Exercises:</p> <p>1. Study and compare the V-I Characteristics of various types of P-N junction diodes (e.g. general purpose, LEDs, Zener Diode, etc.)</p> <p>2. Study and compare the working of Photo diode and Varactor diode</p> <p>3. Study and compare the working properties of the <i>n</i>-channel and <i>p</i>-channel JFETs</p> <p>4. Study and compare the working properties of the <i>n</i>-channel and <i>p</i>-channel MOSFETs</p> <p>5. Construct and test the performance of a FET Amplifier</p> <p>6. Study the working of half wave rectifier and determine ripple factor for different R, L, C filters</p> <p>7. Study the working of full wave rectifier and determine ripple factor for different R, L, C filters</p> <p>8. Study of SCR characteristics</p> <p>9. Study of UJT characteristics</p> <p>10. Construct UJT based free running oscillator and change its frequency.</p> <p>11. Construct a test circuit of SCR using UJT triggering</p> <p>Practicals</p> <p>18. Implementation of Boolean expression from the given truth table using Kmap.</p> <p>19. Study of Colpits oscillator</p> <p>20. Study of Hartley Oscillator</p> <p>21. Study of low pass and high pass filter using resistance and capacitance</p>	13

	22. Clipper and Clamper circuits 23. Study of A.M. Modulator 24. Study of A.M. Demodulator Assignment of two marks questions and answers writing for each papers as a best practices. To conduct fourth unit test on each unit.	
March 2020	Up to second week of this month one- one unit of each papers complete(unite fourth for each paper), and assigned best practices for students write two marks questions and answers writing for each papers. Completed 8-9 practicals of T.Y. conduct fourth unit test on each unite. And at third week university exams stars.	10
April 2020	University exams of B.SC TY students.	


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DEPARTMENT OF PHYSICS

Class: B.SC S.Y

Title of the Paper & No.: Waves and Oscillation & Basic Electronics. VI & IX SEC I & II

Name of the Teacher: Dr. Nemmaniwar B.G.

ANNUAL TEACHING PLAN 2019-20		
Month	Course content	Expected Periods
June 2019	3 rd week colleges starts new academic year 2019-2020, at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. S.Y students	04
July 2019	<p>Unit -I: Waves: Wave velocity and particle velocity, Differential equation of wave motion, Energy of a plane progressive wave, Equation of motion of a vibrating string, Velocity of transverse waves along a string, Frequency and period of vibration of a string,</p> <p>Skill Enhancement Course-I</p> <p>UNIT-I: Basic of Measurement: Instruments accuracy, Precision, Sensitivity, Resolution range, Errors in measurements, Loading effect.</p> <p>UNIT-II: Multimeter: Principle of measurement of dc voltage and dc current, ac voltage, ac current, Resistance, Specifications of a Multimeter and their Significance.</p> <p>To assignment questions and answers writing for each papers as a best practices. To conduct first unit test.</p>	13
Aug 2019	<p>Unit—II: Stationary waves: Analytical treatment of stationary waves (closed end& open end pipe at the other end), Investigation of pressure and density changes at displacement Nodes and Antinodes, Distribution of Energy in a stationary wave, Energy is not transferred in a stationary waves.</p> <p>UNIT-III: Voltmeter: Principles of voltage measurement (block diagram only), Sensitivity Specifications of an electronic voltmeter and its significance, Ac mill voltmeter, Types of ac mill voltmeter.</p> <p>UNIT-IV: Milliammeters: Principle of current measurement, Measurements of dc current, Ac current, Micro ammeters At last week to conduct first university internal exam, to assignment of MCQ questions and answers writing for each papers as a best practices. To conduct second unit test.</p>	12
Sept 2019	<p>Unit - III: Free and Forced Vibrations: Free Vibrations, Forced Vibrations, Resonance, Oscillatory Motion of a particle from energy considerations, Damped simple harmonic motion, Aperiodic, Critically Damped Oscillatory Motions, Effect of damping on Frequency, Forced Vibrations, resonance and Sharpness of resonance.</p> <p>UNIT-V: Impedance Bridges: Block diagram of bridge, Working principles of basic (balancing type) RLC bridge, Specifications of RLC bridge.</p> <p>UNIT-VI: Digital Instruments: Principle and working of digital meters, Comparison of analogue and digital instruments, Characteristics of digital meter,</p>	12

	<p>Working principle of digital voltmeter,Block diagram and working of digital Multimeter.</p> <p>At last week to conduct second university internal exam. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct third unit test.</p>	
Oct 2019	<p>Unit –IV: Acoustics and Ultrasonics: Reverberation, Reverberation time, Derivation of Reverberation Time (Sabine’s formula), Absorption coefficient, Determination of absorption Coefficient (reverberation Chamber Method), Conditions for good acoustical designs of auditorium, Ultrasonics,Piezo-electric & magnetostriction effect, Piezoelectric Oscillator, magnetostriction oscillator, Detection of ultrasonic waves: Acoustic grating</p> <p>Hands on Exercises:</p> <ol style="list-style-type: none"> 1. Measurement of ac and dc voltages by using analogue multimeter. 2. Measurement of resistance using colour code and analogue multimeter. 3. Measurement of ac and dc currents by using multimeter. 4. Measurement of ac and dc voltages by using AC/DC Voltmeters. 5. Measurement of ac and dc currents by using AC/DC Milliammeters. 6. Determination of value of L and C using bridge circuit. 7. Measurement of ac and dc voltages by using digital multimeter. 8. Measurement of resistance using digital multimeter. 9. To study testing of diode and transistor with multimeter. <p>Conduct unit test. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct fourth unit test. And at third week university exams stars</p>	12
Nov 2019	University exams of B.SC FY, SY & TY students and Diwali vacations	
Dec 2019	<p>Unit I: Regulated Power supply : Introduction, ordinary D. C. power supply, Voltage regulation, , Need of regulated power supply, Types of regulators, for low voltage, for high voltage, Zener diode voltage regulator, Transistor series voltage regulator Series feedback voltage regulator short circuit protection, Transistor shunt voltage regulator, Definition of Line and Load regulation, Problems.</p> <p>SEC II UNIT-I: Refraction Through Lenses: Types of lenses, The sign convention, principal foci, Deviation produced by a thin lens, Power of a lens, Principal planes and focal planes, Dispersion by prism, Dispersive power, Huygens eyepiece, Ramsden eyepiece.To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct first unit test.</p>	15
Jan 2020	<p>Unit–II: Bipolar Junction Transistors (BJT): Transistor Connections: Common base, common emitter, common collector, Characteristics of common base, common emitter, common collector connections, transistor Load line Analysis,Operating point. Hybrid parameters (or h parameters) Determination of h-parameters, Analysis of common emitter amplifier and common using h-parameters (current gain, voltage gain, power gain, input resistance and output resistance)</p> <p>UNIT-II: Semiconductor Sources and Detectors: Construction of LED, Working principle of LED, Types of LED, Construction of LDR, Working principle of LDR, Construction of photovoltaic cell & it’s working principle.</p> <p>Polarization of Light: Polarization of transverse wave, Plane of polarization, Brewster law, Malus law, specific rotation, Laurent’s half shade polarimeter</p> <p>At last week to conduct first university internal exam. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct second unit test.</p>	14
Feb	Unit–III: Operational Amplifier:	15

2020	Operational Amplifier, Basic circuit of differential amplifier, common Mode and differential mode signals, block diagram of Op-Amp, schematic symbol, ideal Characteristics, input offset voltage; input offset current, input bias current, input impedance, Output impedance, open loop gain, Slew rate, Inverting amplifier. At last week to conduct second university internal exam. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct third unit test.	
March 2020	<p>Unit IV: Sinusoidal Oscillators: Sinusoidal Oscillator, Types of sinusoidal Oscillators, Oscillatory circuit, Positive feedback Amplifier- Oscillator, Barkhausen Criterion, Hartley oscillator, Colpitt's oscillator, R-C Network, Phase shift oscillator</p> <p>Hands on Exercises:</p> <ol style="list-style-type: none"> 1. Determination of focal length of a biconvex lens. 2. Determination of radius of curvature of a lens using a spherometer. 3. Determination of power of a lens. 4. Determination of the grating radial spacing of a compact disc (CD) by reflection using a laser source. 5. To find the width of the slit using diffraction pattern obtained by a laser. 6. To find angle of polarization using Brewster law. 7. To study V-I characteristics of LED. 8. Study the characteristics of solid state laser. 9. Study the characteristics of LDR. 10. Study characteristics of a photovoltaic cell. <p>Conduct fourth unit test. To assignment of MCQ questions and answers writing for each papers as a best practices. & at third week university exams stars</p>	12
April 2020	University exams starts of B.SC SY students.	

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DEPARTMENT OF PHYSICS

Class: B.SC F.Y

**Title of the Paper & No.: Mechanics & Properties of Matter, Electricity & Magnetism,
& Practical Paper I, IV & V**

Name of the Teacher: Dr. Nemmaniwar B.G.

ANNUAL TEACHING PLAN 2019-20


Month	Course content	Expected Periods
June 2019	Last week colleges starts new academic year 2019-2020, at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. F.Y students	03
July 2019	<p>P-I Core Course: Mechanics and Properties of Matter</p> <p>Unit I: Mechanics Laws of Mechanics (Newton's Laws of Motion), Newton's Law of Gravitation, Kepler's Law of Planetary Motion, Gravitational Field, Gravitational Intensity, Gravitational Potential, Gravitational Potential energy, Conservation Law, Work, Power, Kinetic Energy (Work Energy Theorem), Conservation of energy for a particle energy function, Motion of a body near the surface of earth, Types of conservative and non- conservative forces</p> <p>(P-V) : Physics Practical Paper</p> <ol style="list-style-type: none"> 1. Y- by Spiral spring. 2. η - by Spiral spring. 3. η - by Static torsion. <p>To assignment of MCQ questions and answers writing for papers as a best practices. To conduct first unit test.</p>	12
Aug 2019	<p>Unit-II: Surface Tension Molecular Forces, Surface Tension & its explanation, Pressure difference across a curved surface, Expression for Excess Pressure inside a Spherical Drop and spherical Soap Bubble, Surface Tension by Jaeger's Method, Surface Tension by Ferguson Method.</p> <p>Practical Paper</p> <ol style="list-style-type: none"> 4. η - by Maxwell's needle. 5. Y- by bending loaded at the middle. 6. Viscosity of given liquid by Poiseuille's method. <p>To assignment of MCQ questions and answers writing for papers as a best practices. To conduct second unit test. At last week to conduct first university internal exam</p>	15

Sept 2019	<p>Unit- III: Viscosity Introduction, Coefficient of Viscosity, Streamline flow, critical velocity, Reynolds Number & its significance, Bernoullies Theorem, Poiseuille's equation for the flow of liquid through a tube, Experimental determination of coefficient viscosity by Poiseuille's Method.</p> <p>Practical Paper 7. Surface Tension of liquid by Jaeger's method. 8. Determination of Viscosity of given liquid by Searle's Viscometer. 9. Field along the axis of Circular coil (Determination of radius of the coil) 10. Small resistance by Carry Fosters Bridge. To assignment of MCQ questions and answers writing for papers as a best practices. To conduct third unit test. At last week to conduct second university internal exam</p>	09
Oct 2019	<p>Unit- IV: Elasticity Introduction, Hooke's Law, Elastic Constants ($Y, K \text{ \& } \eta$), Poisson's Ratio, Twisting couple on a cylinder or a (wire), Torsional pendulum, Bending of Beam, Bending Moment, Cantilever (Weight of the beam is ineffective, Weight of the beam is effective), Depression of a Beam supported at the ends and loaded at the Centre, Determination of Y by bending of beam. To assignment of MCQ questions and answers writing for papers as a best practices. To conduct fourth unit test. From third week university semester exams are starts</p>	10
Nov 2019	University exams of B.SC FY, SY & TY students and Diwali vacations	
Dec 2019	<p>P-IV Core Course: Electricity and Magnetism Unit-I: Alternating Current circuits Brief introduction to AC through Capacitor and Inductor, Nature of Impedance(z) and Reactance(x) of Inductance($z_L \text{ \& } x_L$), Capacitance($z_C \text{ \& } x_C$) and Resistance($z_R \text{ \& } x_R$), Complex number and J-operator, Complex Impedance and reactance, Application of Complex numbers in solving AC Circuit (Not vector diagram), L-C-R (Series resonance and Parallel resonance) circuits. Power in AC circuit and Power Factor, Principle, working and types of transformers (step up and step down with figures), Current, voltage and turns ratio of transformer, Efficiency of transformer, AC bridges (Wheatstone bridge).</p> <p>Practical Paper 11. Ballistic galvanometer (Figure of merit) 12. Comparison of capacity by Desauty Method 13. Determination of angle of Prism by Spectrometer To assignment of MCQ questions and answers writing for papers as a best practices. To conduct first unit test.</p>	12
Jan 2020	<p>Unit- II: Magnetization Introduction, Magnetic Induction (B), Flux density, Intensity of magnetization (I), Intensity of magnetizing field (H) Permeability, Susceptibility, Relation between Permeability and Susceptibility, Hysteresis curve, Brief introduction of ferromagnetic, paramagnetic and diamagnetic phenomenon, I-H curve By magnetometer method, Principle and construction of Moving coil type Ballistic Galvanometer with theory (q).</p> <p>Practical Paper 14 Determination of Refractive Index of Prism by Spectrometer 15 Characteristics of P-N junction diode (forward and reverse) 16. Zener Diode Characteristics To assignment of MCQ questions and answers writing for papers as a best</p>	15

	practices. To conduct second unit test. At last week to conduct first university internal exam	
Feb 2020	<p>Unit- III: Electrostatics and Magnetostatics</p> <p>Concept of electric field, electric flux, Gauss's law, conservative nature of electric field, concept of electric potential, potential energy of a system of charges, energy density in an electric field. Concept of Magnetic Field (B) and magnetic flux (Φ), Lorentz Force, Force on a current carrying conductor, Biot and Savert's Law, Applications of Biot-Savert's law to straight and circular current carrying conductor, Amperes circuital law (Integral form), Curl of magnetic field (Ampere's circuital law differential form). Motion of charged particles in uniform electric field, Motion of charged particle in magnetic field, Maxwell's displacement current.</p> <p>To assignment of MCQ questions and answers writing for papers as a best practices. To conduct third unit test. At last week to conduct second university internal exam</p>	11
March 2020	<p>Unit- IV: Time Varying (Dynamic) Fields (Waves)</p> <p>Definition of electromagnetic induction, Faraday's Law of Electromagnetic Induction, Lenz's law, Self induction, Self induction of a Solenoid, Mutual induction, Mutual Induction of a pair of coil, Work done in establishing current in an inductance, Mutual inductance of a Co axial solenoids, Problems.</p> <p>To assignment of MCQ questions and answers writing for papers as a best practices. To conduct fourth unit test. From third week university semester exams are starts</p>	10
April 2020	University exams of B.SC FY, SY & TY students.	

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DEPARTMENT OF PHYSICS

Class: B.SC T.Y


**Title of the Paper & No.: Solid State Physics XIV & XV Digital and Communication
Electronics Name of the Teacher: Dr. Nemmaniwar B.G.**

ANNUAL TEACHING PLAN 2019-2020		
Month	Course content	Expected Periods
June 2019	3 rd week colleges starts new academic year 2019-2020 at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. T.Y students. Unit I Crystal structure Introduction, Crystal Lattices and Translation vectors, Unit cell, Basis, Symmetry operations, Point groups, space group, Types of lattices, Simple crystal structure (HCP, FCC, BCC, SC), Structure of Diamond, NaCl, Problems.	03
July 2019	Wave function, de Broglie Wave Velocity, Wave and Group velocities, G. P. Thomson experiment, The Uncertainty principle. Unit II Bonding in Solids Inter atomic forces and types of bonding, ionic bond, covalent bond, metallic bond, hydrogen bond, Vander-waal's bond. Problems. And its applications Classification of metals , semiconductors, insulators	09
Aug 2019	Unit III Thermal properties of Solids Specific heat of gases, Specific heat of solids, Classical theory of Lattice heat Capacity, Einstein's theory of heat Capacity, Debye's theory of specific heat of solids, Limitations of Debye model Practicals 1. Determination of Planck constant (h) by photo cell. 2. e / m by Thomson's method 3. Determination of resolving power of prism 4. Diffraction at Cylindrical Object: Determination of Wavelength 5. Thermal conductivity of an insulator by Lee's disc method.	12
Sept 2019	Unit IV Free Electron Theory of Metals The outstanding properties of metals, Drude-Lorentz theory, Thermal conductivity, Electrical conductivity, Widemann-Franz relation, Sommerfeld Model, Electrical conductivity. Conduct third unit test on each unite. 6. Resolving power of grating 7. Y By Konings Method 8. To Study the Spectral Characteristics of a photovoltaic solar cell	12

	9. To determine the wavelength of H-alpha emission line in Hydrogen spectrum	
Oct 2019	Up to second week of this month one- one unit of each papers complete(unite fourth for each paper), and assigned best practices for students write two marks questions and answers writing for each papers. Completed 8-9 practical's of T.Y. conduct fourth unit test on each unit. And at third week university exams stars	10
Nov 2019	University exams of B.SC T.Y students and Diwali vacations. First week of this month starts lecturers on B.SC T.Y students Papers XIV.	
Dec 2019	<p>Unit I Number Systems Number System:- Decimal numbers, Binary numbers, Binary arithmetic, Ones complement representation, Twos complement representation, Octal Numbers, Hexadecimal numbers, Inter-conversions of number Systems, Binary coded decimal (BCD), Gray code, Excess-3 code.</p> <p>Practical's</p> <ol style="list-style-type: none"> 1.To study the Hysteresis curve of the transformer core 2. Study of variation of thermo e.m.f. as a function of temperature 3. Study of CRO Measurement of frequency and voltage sensitivity 4. Determination of electrical conductivity of graphite rod 5. Determination of temperature coefficient of thermister 6. Study of energy bad gap of a semiconductor 7. Determination of Planck constant (h) by LED 8. Comparison of capacity by Method of mixture <p>Assignment of two marks questions and answers writing for each paper as a best practices. To conduct first & second unit test on each unit.</p>	12
Jan 2020	<p>Full wave rectifiers</p> <p>Unit II Logic Gates</p> <p>AND gate, OR gate, NOT gate, NAND gate, NOR gate, EX-OR and EX-NOR gates, Universal properties of NAND and NOR gates. Boolean operations, logic expressions for 2,3 & 4 inputs, laws of Boolean algebra, De -Morgen's theorems, SOP form of Boolean expressions, simplification of Boolean expressions using K- maps (up to 4 variables), Half adder, Full adder</p> <p>Practicals</p> <ol style="list-style-type: none"> 9. I-H curve by Magnetometer method 10. To measure resistivity of semiconductor by four probe method 11. Determination of crystal structure using Laue pattern 12. Determination of crystal structure by rotating crystal method 13. Verification of truth table of basic gates (AND, OR, NOT) using ICs. 14. Construction of basic gates (AND, OR, NOT) using NAND gates 15. Construction of basic gates (AND, OR, NOT) using NOR gates 16. Construction and study of half adder using NAND gates. 17. Construction and study of full adder using NAND gates. <p>Assignment of two marks questions and answers writing for each papers as a best practices. To conduct second, third & fourth unit test on each unit.</p>	10
Feb 2020	<p>Unit III Modulation and Demodulation</p> <p>Introduction, Types of Modulation, Expression for A. M. voltage, AM waves, Frequency spectrum of AM wave, Power Output in AM, Expression for frequency modulated voltage, Principle of demodulation, linear diode AM detector or demodulator.</p> <p>Unit IV Communication Electronics:</p> <p>Introduction, Block diagram of basic communication system, Essential elements of A.M. Transmitter.A.M. receiver: Turned Radio Frequency (TRF) Receiver, Super heterodyne receiver, Characteristics of radio receivers: sensitivity, selectivity, fidelity & their measurements</p> <p>Practicals</p> <ol style="list-style-type: none"> 18. Implementation of Boolean expression from the given truth table using Kmap. 	12

	19. Study of Colpits oscillator 20. Study of Hartley Oscillator 21. Study of low pass and high pass filter using resistance and capacitance 22. Clipper and Clamper circuits 23. Study of A.M. Modulator 24. Study of A.M. Demodulator	
March 2020	Assignment of two marks questions and answers writing for each papers as a best practices. To conduct fourth unit test on each unit. Up to second week of this month one- one unit of each papers complete(unite fourth for each paper), and assigned best practices for students write two marks questions and answers writing for each papers. Completed 8-9 practicals of T.Y. conduct fourth unit test on each unite. And at third week university exams stars.	10
April 2020	University exams of B.SC TY students.	


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DEPARTMENT OF PHYSICS

Class: B.SC S.Y

Title of the Paper & No.: **Electromagnetic Theory & Relativity (P-VII) Optics and Laser (P-VIII)**

Name of the Teacher: Mrs Waghole M.G.. (CHB)

ANNUAL TEACHING PLAN 2019-20		
Month	Course content	Expected Periods
June 2019	3 rd week colleges starts new academic year 2019-2020 at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. S.Y students	04
July 2019	Unit I Statistical Basis and Thermodynamics Statistical Basis, probability , probability and frequency, permutation and combinations, Micro and Macro states, Thermodynamic probability, Entropy & probability	10
Aug 2019	Unit—II: Classical Statistics and Quantum Statistics Phase space, Maxwell-Boltzmann Distribution law, Quantum Statistics- Bose-Einstein Distribution law, Fermi- Dirac Distribution law, comparison of M. B., B.E. and F. D. statistics, Application of Quantum statistics to Photon gas and Electron	11
Sept 2019	Unit III Electromagnetic Theory and Maxwell's Equations Ampere's Law and Steady State current, Generalization of Ampere's Law and displacement current, Maxwell's Equations, Derivation of Maxwell's Equations, The electromagnetic Energy and Poynting Vector, The wave Equation.	12
Oct 2019	Unit IV Relativity Introduction, frame of reference, , Postulates of Special Theory of Relativity, Galilean Transformations, Lorentz Transformations, Length Contraction, Time dilation, Velocity addition, relativity of mass, Mass energy relation	10
Nov 2019	University exams of B.SC SY students and Diwali vacations	
Dec 2019	Unit-I: Geometrical Optics Cardinal Points of an Optical System(six points), Coaxial Lens System (equivalent focal length and cardinal points), Huygens Eyepiece, Ramsden Eyepiece and their cardinal points,	12
Jan 2020	Unit-II: Interference and Diffraction: Newton's Rings, Determination of wavelength of Sodium light, Michelson Interferometer, Determination of wavelength of monochromatic light, Difference in wavelength between two neighboring spectral lines. Diffraction: Fresnel and Fraunhofer diffraction, Fraunhofer's diffraction due to single and double slit, Plane diffraction grating, Determination of wavelength of Sodium light, Rayleigh criterion, Resolving Power of grating, Resolving power of Prism.	11
Feb	Unit-III: Polarization of Light	13

2020	Polarization by Reflection, Brewster's law, Malus law, Double refraction, Nicol prism, Nicol prism as an analyzer, Huygen's explanation of double Refraction in Uniaxial crystals, Quarter wave plate, Half wave plate, Optical Activity , Specific rotation, Laurent's half shade polarimeter.	
March 2020	UNIT-III: Laser: Lasers, spontaneous and stimulated emission, Theory of laser action, Einstein's coefficients, Light amplification, Characterization of laser beam, He-Ne laser, Semiconductor lasers	12
April 2020	University exams start of B.SC SY students.	



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DEPARTMENT OF PHYSICS

Class: B.SC F.Y

**Title of the Paper & No.: Mathematical Methods in Physics and Heat and Thermodynamics.
& Practical Paper II, III**

Name of the Teacher: Miss. Ghan V.W.(CHB)

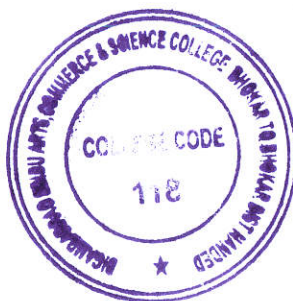
ANNUAL TEACHING PLAN 2019-20

Month	Course content	Expected Periods
June 2019	Last week colleges starts new academic year 2019-2020 at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. F.Y students	03
July 2019	Unit I: Complex variables Introduction, Definition, complex algebra (Addition, Subtraction, Multiplication, Division, conjugate complex number), Argand diagram, Graphical representation of Sum, Difference, product and Quotient of complex number, Properties of moduli ,arguments and geometry of complex numbers, Rectangular, polar and exponential form of complex numbers.	12
Aug 2019	Unit-II: Vector Analysis Introduction to Scalars, Vectors, Dot products and Cross Product of two vectors, Vector triple product, Scalar triple product, Scalar and vector field , Gradient of a scalar field , Divergence of a vector field and Curl of a vector field and their Physical interpretation , Laplacian Operator (∇^2), Line integral, Surface integral, Volume integral, Gauss's divergence theorem, Stoke's theorem, (Statements only), Vector identities.	09
Sept 2019	Unit -III: Partial Differentiation Definition of Partial Differentiation, Order or Successive Differentiation, total Differentiation and Chain rule, Change of variables from Cartesian to Polar Co-ordinates, Condition for maxima and minimum (without proof), Linear Homogeneous Partial differential equations with constant coefficients, Rules for finding the complementary function.	12
Oct 2019	Unit -IV: Fourier series Introduction of Periodic Functions, Definition of Fourier Series, Evaluation of the coefficients of Fourier series, Cosine series, Sine series, Dirichlet's Conditions, Graphical representations of even and odd functions, Advantages of Fourier series, Physical applications of Fourier series analysis: Square wave and half wave Rectifier.	10
Nov 2019	University exams of B.SC FY students and Diwali vacations	
Dec 2019	Unit -II: Real Gases and Their Behavior Behavior of gases at high pressure, Boyle temperature, Andrew's Experiment on CO ₂ , Amagat's Experiment, Vander wall's Equation of State, Critical Constants, Corresponding states, Coefficients of Vander wall's Equation, Reduced Equation of State, Joule Thomson Porous Plug Experiment, Temperature of Inversion, Relation between Boyle temperature and Temperature of Inversion.	14

Jan 2020	Unit-I Kinetic Theory of Gases Molecular Collisions, Mean free path, Expression for mean free path, Transport Phenomena, Viscosity of Gases, Thermal Conductivity of Gases, Diffusion, Inter relation between three transport coefficients	12
Feb 2020	Unit-IV: Thermodynamics and Thermodynamical Relations First Law of Thermodynamics, Relation connecting P, V and T in an Adiabatic Process, Second Law of Thermodynamics (Kelvin and Clausius statements), Carnot's cycle, Carnot's heat Engine, Carnot's Theorem, Entropy, Entropy of Irreversible processes entropy of reversible process, Third Law of Thermodynamics. Internal energy, Helmholtz' function, Enthalpy, Gibb's function, Maxwell's Thermodynamical Relations, T- dS equations, Clausius-Clapeyron latent heat equations.	10
March 2020	To assignment of MCQ questions and answers writing for papers as a best practices. To conduct fourth unit test. From third week university semester exams are starts	10
April 2020	University exams of B.SC FY students.	


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Department of Physics

Annual Teaching Plan for 2020-2021

Workload Distribution

Class	Teachers Name			
	Dr.Nemmaniwar B.G.		Mr. Makode U.G.	
	Theory	Practical	Theory	Practical
B.Sc. I Sem.-I	Paper-I	Paper-V	Paper-II	
B.Sc. I Sem.-II	Paper- III		Paper- IV	
B.Sc. II Sem.-III	Paper-VII	*	Paper-VI	Paper-X & XI
B.Sc. II Sem.-IV	Paper- IX		Paper-VIII	
B.Sc. III Sem.-V	Paper-XIII	Paper-XVI & XVII		
B.Sc. III Sem.-VI	Paper-XV		Paper-XIV	


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DEPARTMENT OF PHYSICS

Class: B.SC T.Y

Title of the Paper & No.: Quantum Mechanics and Atomic & Molecular Phy. XII and XIV XVI
(Practicals). SEC III & IV

Name of the Teacher: Dr. Nemmaniwar B.G.

ANNUAL TEACHING PLAN 2020-2021

Month	Course content	Expected Periods
Sept To Oct 2020	<p>Online Mode Teaching 3 rd week colleges starts new academic year 2020-2021, at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. T.Y students.</p> <p>Unit I Particle Properties of Waves. Introduction, Photoelectric Effect Quantum Theory of Light, The Compton Effect, de Broglie waves, Wave function</p>	16
Oct 2020	<p>Off line Mode Teaching de Broglie Wave Velocity, Wave and Group velocities, G. P. Thomson experiment, The Uncertainty principle and its applications.</p> <p>Unit II Schrödinger's Equation Introduction, Schrödinger's Equation: Time dependent form, Probability current, Expectation Values, Operators, Schrödinger's Equation: Steady-state form, Eigen values and Eigen functions, Problems</p>	05
Nov to Nov 2020	Diwali vacations	
Nov 2020	<p>. SEC III (A) Skill Enhancement Course: A. Renewable Energy and Harvesting. Unit 1 Fossil Fuels and Alternate Sources of Energy Fossil fuels and Nuclear Energy, Need of renewable energy, Non-conventional energy sources, Wind Energy, Tidal Energy, Solar Energy, Biomass Energy. Starts Practical's</p> <ol style="list-style-type: none"> 1. Coefficient of viscosity by oscillating disc method 2. Determination of Rydberg's constant 3. Hartmann's dispersion formula 4. Temperature of flame 5. Cauchy's constant by using spectrometer 6. Conductivity by Forbe's method 	12
Dec 2020	<p>Unit III Applications of Quantum Mechanics Introduction, The particle in a box: energy quantization, The particle in a box: wave functions, The particle in a box: Momentum Quantization, The Harmonic Oscillator, The Harmonic Oscillator-Energy level, The particle in a three dimensional box</p> <p>Unit 2 Solar Energy and Harvesling Importance, Storage of Solar Energy, Applications of Solar Energy, Solar Water Heater, Solar Distillation, Solar Cooker, Solar Green houses, Solar cell</p>	14

	<p>characteristics of Photovoltaic (pv) Systems.</p> <p>Practicals</p> <p>7. Determination of Planck constant (h) by photo cell.</p> <p>8. e/m by Thomson's method</p> <p>9. Determination of resolving power of prism</p> <p>10. Diffraction at Cylindrical Object: Determination of Wavelength</p> <p>11. Thermal conductivity of an insulator by Lee's disc method.</p>	
Jan To 2021	<p>Online Mode Teaching</p> <p>Unit IV Quantum Theory of Hydrogen Atom Schrödinger's equation for the Hydrogen Atom in spherical polar co-ordinates, separation of Variables, Quantum numbers –Total quantum number, Orbital quantum number, Magnetic quantum number, spin quantum number.</p> <p>At last week to conduct second university internal exam</p> <p>Unit 3 Wind Energy Harvesling</p> <p>Fundameials of Wind Energy, Wind Turbines and Different Electrical Machines in Wind Turbines, Power Electronic Interfaces and Grid Interconnection Technologies.</p> <p>12. Resolving power of grating</p> <p>13. Y By Konings Method</p> <p>14. To Study the Spectral Characteristics of a photovoltaic solar cell</p> <p>15. To determine the wavelength of H-alpha emission line in Hydrogen spectrum</p>	12
Feb 2021	<p>Off line Mode Taching</p> <p>Up to second week of this month one- one unit of each papers complete(unite fourth for each paper), and assigned best practices for students write two marks questions and answers writing for each papers. Completed 8-9 practical's of T.Y. conduct fourth unit test on each unit. And at third week university exams stars</p> <p>Unit 4 Ocean Energy</p> <p>Oscean Energy Potential against Wind and Solar Eenvgy. Wave Energy Devices. Geothermal Energy Technologies, Hydropower Technologies</p> <p>Hands on Exercises:</p> <ol style="list-style-type: none"> 1. Studying basics of solar energy 2. Assemble solar cooker 3. Studying basics of solar electricity 4. Installation of solar panels and solar energy harvesting 5. Studying basics of Biomass Energy as an alternative source 6. Generating electricity from wind energy and its storage 7. Studying the construction and working of a solar lantern 8. Designing and constructing photovoltaic system for a domestic house requiring 5kVA power 9. Designing and constructing wind turbine system to power a house requiring 2kVA 	15
Feb to 2021	University exams of B.SC FY, SY, TY students. Sem I,III & V	
Feb 2021	<p>Last week of this month starts lecturers on B.SC T.Y students Papers XIV & XV.</p> <p>Unit I Atomic Physics The Vector Atom Model, Quantum numbers associated with the vector atom model, LS and J-J coupling, The Pauli's exclusion Principle, Selection rules, Intensity rules, Interval rule, Normal Zeeman effect, Anomalous Zeeman effect, Stark effect.</p>	14
March 2021	<p>Unit II Molecular Spectra Regions of Electromagnetic Spectra, Classification of Molecular Spectra, Theory of pure rotational spectra, Theory of rotation-vibration spectra, Raman Effect, Experimental study,</p> <p>SEC IV (A) Skill Enhancement Course</p> <p>Unit I Semiconductor Diodes</p>	12

	<p>Construction, working and characteristics of different types of P-N junction diodes, Construction, working and characteristics of Zener diode, Construction, working and characteristics of Photo diode and Varactor diode.</p> <p>Unit II Field Effect Transistors</p> <p>Construction, working and characteristics of JFET, Construction, working and characteristics of MOSFET.</p> <p>Practical's</p> <ol style="list-style-type: none"> To study the Hysteresis curve of the transformer core Study of variation of thermo e.m.f. as a function of temperature Study of CRO Measurement of frequency and voltage sensitivity Determination of electrical conductivity of graphite rod Determination of temperature coefficient of thermister Study of energy band gap of a semiconductor Determination of Planck constant (h) by LED Comparison of capacity by Method of mixture <p>Assignment of two marks questions and answers writing for each paper as a best practices. To conduct first & second unit test on each unit</p>	
April 2021	<p>Unit III Particle Accelerators</p> <p>Need of particle accelerators, Van de Graff Generator, Linear accelerator, Cyclotron, Synchrotron, Betatron.</p> <p>SEC</p> <p>Unit III Rectifiers</p> <p>Block diagram of power supply, half wave rectifier, Full wave rectifier, ripple factor and efficiency of half and Full wave rectifiers</p> <p>Unit IV Thyristor and UJTs</p> <p>Construction, working and characteristics of SCR and Construction, working and characteristics of UJT.</p> <p>Practicals</p> <ol style="list-style-type: none"> I-H curve by Magnetometer method To measure resistivity of semiconductor by four probe method Determination of crystal structure using Laue pattern Determination of crystal structure by rotating crystal method Verification of truth table of basic gates (AND, OR, NOT) using ICs. Construction of basic gates (AND, OR, NOT) using NAND gates Construction of basic gates (AND, OR, NOT) using NOR gates Construction and study of half adder using NAND gates. Construction and study of full adder using NAND gates. <p>Assignment of two marks questions and answers writing for each papers as a best practices. To conduct second, third & fourth unit test on each unit.</p>	13
May 2021	<p>Unit IV Nuclear Fission, Fusion and Nuclear Reactions</p> <p>Nuclear Fission, the fission products, energy release in fission, nuclear transmutations (by alpha particles, protons, deuterons and neutrons), conservation laws, Nuclear reaction kinematics</p> <p>Introduction to Nuclear fusion, thermo-nuclear reactor, the neutron cycle.</p> <p>SEC Hands on Exercises:</p> <ol style="list-style-type: none"> Study and compare the V-I Characteristics of various types of P-N junction diodes (e.g. general purpose, LEDs, Zener Diode, etc.) Study and compare the working of Photo diode and Varactor diode Study and compare the working properties of the <i>n</i>-channel and <i>p</i>-channel JFETs Study and compare the working properties of the <i>n</i>-channel and <i>p</i>-channel MOSFETs Construct and test the performance of a FET Amplifier Study the working of half wave rectifier and determine ripple factor for 	10

	<p>different R, L, C filters</p> <p>7. Study the working of full wave rectifier and determine ripple factor for different R, L, C filters</p> <p>8. Study of SCR characteristics</p> <p>9. Study of UJT characteristics</p> <p>10. Construct UJT based free running oscillator and change its frequency.</p> <p>11. Construct a test circuit of SCR using UJT triggering</p> <p>Practicals</p> <p>18. Implementation of Boolean expression from the given truth table using Kmap.</p> <p>19. Study of Colpits oscillator</p> <p>20. Study of Hartley Oscillator</p> <p>21. Study of low pass and high pass filter using resistance and capacitance</p> <p>22. Clipper and Clamper circuits</p> <p>23. Study of A.M. Modulator</p> <p>24. Study of A.M. Demodulator</p> <p>Assignment of two marks questions and answers writing for each papers as a best practices. To conduct fourth unit test on each unit.</p> <p>Up to second week of this month one- one unit of each papers complete (unit four for each paper), and assigned best practices for students write two marks questions and answers writing for each papers. Completed 8-9 practicals of T.Y. conduct fourth unit test on each unit. And at third week university exams stars.</p>	
June-2021	University exams of B.SC FY, SY, TY students. Sem II, IV & VI	



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DEPARTMENT OF PHYSICS

Class: B.SC S.Y

Title of the Paper & No.: Waves and Oscillation & Basic Electronics. VI & IX SEC I & II

Name of the Teacher: Dr. Nemmaniwar B.G.

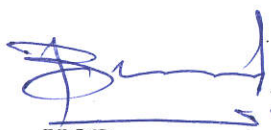
ANNUAL TEACHING PLAN 2020-2021

Month	Course content	Expected Periods
Sept 2020	<p>Online Mode Teaching 3 rd week colleges starts new academic year 2020-2021, at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. S.Y students.</p> <p>Unit –I: Waves: Wave velocity and particle velocity, Differential equation of wave motion, Energy of a plane progressive wave, Equation of motion of a vibrating string, Velocity of transverse waves along a string, Frequency and period of vibration of a string</p>	25
Oct 2020	<p>Off Line Mode Teaching Skill Enhancement Course-I UNIT-I: Basic of Measurement: Instruments accuracy, Precision, Sensitivity, Resolution range, Errors in measurements, Loading effect. UNIT-II: Multimeter: Principle of measurement of dc voltage and dc current, ac voltage, ac current, Resistance, Specifications of a Multimeter and their Significance. To assignment questions and answers writing for each papers as a best practices. To conduct first unit test.</p>	04
Nov 2020	Diwali vacations	
16 Nov 2020	<p>Unit—II: Stationary waves: Analytical treatment of stationary waves (closed end & open end pipe at the other end), Investigation of pressure and density changes at displacement Nodes and Antinodes, Distribution of Energy in a stationary wave, Energy is not transferred in a stationary waves.</p>	13
Dec 2020	<p>UNIT-III: Voltmeter: Principles of voltage measurement (block diagram only), Sensitivity Specifications of an electronic voltmeter and its significance, Ac mill voltmeter, Types of ac mill voltmeter.</p> <p>UNIT-IV: Milliammeters: Principle of current measurement, Measurements of dc current, Ac current, Micro ammeters At last week to conduct first university internal exam, to assignment of MCQ questions and answers writing for each papers as a best practices. To conduct second unit test.</p>	12
Jan 2021	<p>Online Mode Teaching Unit - III: Free and Forced Vibrations: Free Vibrations, Forced Vibrations, Resonance, Oscillatory Motion of a particle</p>	12

	<p>from energy considerations, Damped simple harmonic motion, Aperiodic, Critically Damped Oscillatory Motions, Effect of damping on Frequency, Forced Vibrations, resonance and Sharpness of resonance.</p> <p>UNIT-V: Impedance Bridges: Block diagram of bridge, Working principles of basic (balancing type) RLC bridge, Specifications of RLC bridge.</p> <p>UNIT-VI: Digital Instruments: Principle and working of digital meters, Comparison of analogue and digital instruments, Characteristics of digital meter, Working principle of digital voltmeter. Block diagram and working of digital Multimeter.</p> <p>At last week to conduct second university internal exam. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct third unit test.</p>	
Feb 2021	<p>Unit –IV: Acoustics and Ultrasonics: Reverberation, Reverberation time, Derivation of Reverberation Time (Sabine’s formula), Absorption coefficient, Determination of absorption Coefficient (reverberation Chamber Method), Conditions for good acoustical designs of auditorium, Ultrasonics, Piezo-electric & magnetostriction effect, Piezoelectric Oscillator, magnetostriction oscillator, Detection of ultrasonic waves: Acoustic grating</p> <p>Hands on Exercises:</p> <ol style="list-style-type: none"> 1. Measurement of ac and dc voltages by using analogue multimeter. 2. Measurement of resistance using colour code and analogue multimeter. 3. Measurement of ac and dc currents by using multimeter. 4. Measurement of ac and dc voltages by using AC/DC Voltmeters. 5. Measurement of ac and dc currents by using AC/DC Milliammeters. 6. Determination of value of L and C using bridge circuit. 7. Measurement of ac and dc voltages by using digital multimeter. 8. Measurement of resistance using digital multimeter. 9. To study testing of diode and transistor with multimeter. <p>Conduct unit test. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct fourth unit test. And at third week university exams stars</p>	12
Feb 2021	University exams of B.SC FY, SY & TY students Sem I, III & V	
Feb 2021	<p>Unit I: Semiconductor Semiconductor, Types of Semiconductor, p-N Junction diode, Zenor diode, light emitting diode, Photodiode, Varactor diode and their V/I characteristics</p> <p>SEC II UNIT-I: Refraction Through Lenses: Types of lenses, The sign convention, principal foci, Deviation produced by a thin lens, Power of a lens, Principal planes and focal planes, Dispersion by prism, Dispersive power, Huygens eyepiece, Ramsden eyepiece. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct first unit test.</p>	5
March 2021	<p>Unit–II Bipolar Junction Transistors (BJT): Transistor Connections: Common base, common emitter, common collector, Characteristics of common base, common emitter, common collector connections, Hybrid parameters (or h parameters) Determination of h-parameters, Analysis of common emitter amplifier and common collector amplifier using hparameters (current gain, voltage gain, power gain, input resistance and output resistance)</p> <p>UNIT-II: Semiconductor Sources and Detectors: Construction of LED, Working principle of LED, Types of LED, Construction of LDR, Working principle of LDR, Construction of photovoltaic cell & it’s working principle.</p>	14
April 2021	<p>Unit–III: Operational Amplifier: Operational Amplifier, Basic circuit of differential amplifier, common Mode and</p>	15

	differential mode signals, block diagram of Op-Amp, schematic symbol, ideal Characteristics, input offset voltage; input offset current, input bias current, input impedance, Output impedance, open loop gain, Slew rate, Inverting amplifier. At last week to conduct second university internal exam. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct third unit test.	
May 2021	<p>Unit IV: Sinusoidal Oscillators: Sinusoidal Oscillator, Types of sinusoidal Oscillators, Oscillatory circuit, Positive feedback Amplifier- Oscillator, Barkhausen Criterion, Hartley oscillator, Colpitt's oscillator, R-C Network, Phase shift oscillator</p> <p>Hands on Exercises:</p> <ol style="list-style-type: none"> 1. Determination of focal length of a biconvex lens. 2. Determination of radius of curvature of a lens using a spherometer. 3. Determination of power of a lens. 4. Determination of the grating radial spacing of a compact disc (CD) by reflection using a laser source. 5. To find the width of the slit using diffraction pattern obtained by a laser. 6. To find angle of polarization using Brewster law. 7. To study V-I characteristics of LED. 8. Study the characteristics of solid state laser. 9. Study the characteristics of LDR. 10. Study characteristics of a photovoltaic cell. <p>Conduct fourth unit test. To assignment of MCQ questions and answers writing for each papers as a best practices. & at third week university exams stars</p>	12
June 2021	University exams starts of B.SC SY students. SEM II,IV & VI	


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DEPARTMENT OF PHYSICS

Class: B.SC F.Y

Title of the Paper & No.: Mechanics & Properties of Matter, Electricity & Magnetism.
& Practical Paper I, IV & V

Name of the Teacher: Dr. Nemmaniwar B.G.

ANNUAL TEACHING PLAN 2020-2021


Month	Course content	Expected Periods
Oct 2020	Last week colleges starts new academic year 2020-2021, at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. F.Y students	08
Nov 2020	Diwali vacations	
1Nov 2020	<p>P-I Core Course: Mechanics and Properties of Matter</p> <p>Unit I: Mechanics Laws of Mechanics (Newton's Laws of Motion), Newton's Law of Gravitation, Kepler's Law of Planetary Motion, Gravitational Field, Gravitational Intensity, Gravitational Potential, Gravitational Potential energy, Conservation Law, Work, Power, Kinetic Energy (Work Energy Theorem), Conservation of energy for a particle energy function, Motion of a body near the surface of earth, Types of conservative and non- conservative forces</p> <p>(P-V) : Physics Practical Paper</p> <p>1. Y- by Spiral spring. 2. η - by Spiral spring. 3. η - by Static torsion. To assignment of MCQ questions and answers writing for papers as a best practices. To conduct first unit test.</p>	12
Dec 2020	<p>Unit-II: Surface Tension Molecular Forces, Surface Tension & its explanation, Pressure difference across a curved surface, Expression for Excess Pressure inside a Spherical Drop and spherical Soap Bubble, Surface Tension by Jaeger's Method, Surface Tension by Ferguson Method.</p> <p>Practical Paper</p> <p>4. η - by Maxwell's needle. 5. Y- by bending loaded at the middle. 6. Viscosity of given liquid by Poiseuille's method. To assignment of MCQ questions and answers writing for papers as a best practices. To conduct second unit test. At last week to conduct first university</p>	15

	internal exam	
Jan 2021	<p>Unit- III: Viscosity Introduction, Coefficient of Viscosity, Streamline flow, critical velocity, Reynolds Number & its significance, Bernoulli's Theorem, Poiseuille's equation for the flow of liquid through a tube, Experimental determination of coefficient viscosity by Poiseuille's Method.</p> <p>Practical Paper 7. Surface Tension of liquid by Jaeger's method. 8. Determination of Viscosity of given liquid by Searle's Viscometer. 9. Field along the axis of Circular coil (Determination of radius of the coil) 10. Small resistance by Carry Fosters Bridge.</p> <p>To assignment of MCQ questions and answers writing for papers as a best practices. To conduct third unit test. At last week to conduct second university internal exam</p>	09
Feb 2021	<p>Unit- IV: Elasticity Introduction, Hooke's Law, Elastic Constants (Y, K & η), Poisson's Ratio, Twisting couple on a cylinder or a (wire), Torsional pendulum, Bending of Beam, Bending Moment, Cantilever (Weight of the beam is ineffective, Weight of the beam is effective), Depression of a Beam supported at the ends and loaded at the Centre, Determination of Y by bending of beam, To assignment of MCQ questions and answers writing for papers as a best practices. To conduct fourth unit test. From third week university semester exams are starts</p>	10
Feb 2021	University exams of B.SC FY, SY & TY students	
Feb 2021	<p>P-IV Core Course: Electricity and Magnetism</p> <p>Unit- I: Electrostatics and Magnetostatics Concept of electric field, electric flux, Gauss's law, conservative nature of electric field, concept of electric potential, potential energy of a system of charges, energy density in an electric field. Concept of Magnetic Field (B) and magnetic flux (Φ), Lorentz Force, Force on a current carrying conductor, Biot and Savert's Law, Applications of Biot-Savert's law to straight and circular current carrying conductor, Amperes circuital law (Integral form), Curl of magnetic field (Amperes circuital law differential form). Motion of charged particles in uniform electric field, Motion of charged particle in magnetic field, Maxwell's displacement current.</p> <p>Practical Paper 11. Ballistic galvanometer (Figure of merit) 12. Comparison of capacity by Desauty Method 13. Determination of angle of Prism by Spectrometer</p> <p>To assignment of MCQ questions and answers writing for papers as a best practices. To conduct first unit test.</p>	6
March 2021	<p>Unit- II: Magnetization Introduction, Magnetic Induction (B), Flux density, Intensity of magnetization (I), Intensity of magnetizing field (H) Permeability, Susceptibility, Relation between Permeability and Susceptibility, Hysteresis curve, Brief introduction of ferromagnetic, paramagnetic and diamagnetic phenomenon, I-H curve By magnetometer method, Principle and construction of Moving coil type Ballistic Galvanometer with theory (q).</p> <p>Practical Paper 14 Determination of Refractive Index of Prism by Spectrometer</p>	15

	<p>15 Characteristics of P-N junction diode (forward and reverse)</p> <p>16. Zener Diode Characteristics</p> <p>To assignment of MCQ questions and answers writing for papers as a best practices. To conduct second unit test. At last week to conduct first university internal exam</p>	
April 2021	<p>Unit- III: Time Varying (Dynamic) Fields (Waves)</p> <p>Definition of electromagnetic induction, Faraday's Law of Electromagnetic Induction, Lenz's law, Self induction, Self induction of a Solenoid, Mutual induction, Mutual Induction of a pair of coil, Work done in establishing current in an inductance, Mutual inductance of a Co axial solenoids, Problems.</p>	11
May 2021	<p>Unit-IV: Alternating Current circuits</p> <p>Brief introduction to AC through Capacitor and Inductor, Nature of Impedance(z) and Reactance(x) of Inductance(Z_L & X_L), Capacitance(Z_C & X_C) and Resistance(Z_R & X_R), Complex number and J-operator, Complex Impedance and reactance, Application of Complex numbers in solving AC Circuit (Not vector diagram), L-C-R (Series resonance and Parallel resonance) circuits. Power in AC circuit and Power Factor, Principle, working and types of transformers (step up and step down with figures), Current, voltage and turns ratio of transformer, Efficiency of transformer, AC bridges (Wheatstone bridge). To assignment of MCQ questions and answers writing for papers as a best practices. To conduct third unit test. At last week to conduct second university internal exam</p>	10
June 2021	University exams of B.SC FY, SY & TY students.	

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DEPARTMENT OF PHYSICS

Class: B.SC T.Y

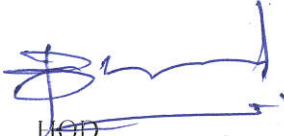
Title of the Paper & No.: Solid State Physics XIV & XV Digital and Communication
Electronics Name of the Teacher: Dr. Nemmaniwar B.G.

ANNUAL TEACHING PLAN 2020-2021		
Month	Course content	Expected Periods
Sept 2020	<p>Online Mode Teaching 3 rd week colleges starts new academic year 2020-2021 at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. T.Y students.</p> <p>Unit I Crystal structure Introduction, Crystal Lattices and Translation vectors, Unit cell, Basis, Symmetry operations, Point groups, space group, Types of lattices, Simple crystal structure (HCP, FCC, BCC, SC), Structure of Diamond, NaCl, Problems.</p>	23
Oct 2020	<p>Unit II Bonding in Solids and X-Ray Diffraction Inter atomic forces and types of bonding, ionic bond, covalent bond, metallic bond, hydrogen bond, Vander-waal's bond. X-ray diffraction, Bragg's law, Laue's method, Rotating crystal method</p>	03
Nov 2020	Diwali Vacations	
16 Nov 2020	<p>Unit III Thermal properties of Solids Specific heat of gases, Specific heat of solids, Classical theory of Lattice heat Capacity, Einstein's theory of heat Capacity, Debye's theory of specific heat of solids, Limitations of Debye model</p>	09
Dec 2020	<p>Practicals 1. Determination of Planck constant (h) by photo cell. 2. e / m by Thomson's method 3. Determination of resolving power of prism 4. Diffraction at Cylindrical Object: Determination of Wavelength 5. Thermal conductivity of an insulator by Lee's disc method.</p>	12
Jan 2021	<p>Online Mode Teaching Unit IV Free Electron Theory of Metals The outstanding properties of metals, Drude-Lorentz theory, Thermal conductivity, Electrical conductivity, Widemann- Franz relation, Sommerfeld Model, Electrical conductivity and Ohms law, Electronic specific heat, Thermoionic emission, escape of electrons from metal. 6. Resolving power of grating 7. Y By Konings Method 8. To Study the Spectral Characteristics of a photovoltaic solar cell 9. To determine the wavelength of H-alpha emission line in Hydrogen spectrum</p>	15
Feb	Up to second week of this month one- one unit of each papers complete(unite	10

2021	fourth for each paper), and assigned best practices for students write two marks questions and answers writing for each papers. Completed 8-9 practical's of T.Y. conduct fourth unit test on each unit. And at third week university exams stars	
Feb 2021	University exams of B.SC T.Y students. Last week of this month starts lecturers on B.SC T.Y students Papers XIV.	
Feb 2021	<p>Unit I Number Systems Number System:- Decimal numbers, Binary numbers, Binary arithmetic, Ones complement representation, Twos complement representation, Octal Numbers, Hexadecimal numbers, Inter-conversions of number Systems, Binary coded decimal (BCD), Gray code, Excess-3 code.</p> <p>Practical's</p> <ol style="list-style-type: none"> To study the Hysteresis curve of the transformer core Study of variation of thermo e.m.f. as a function of temperature Study of CRO Measurement of frequency and voltage sensitivity Determination of electrical conductivity of graphite rod Determination of temperature coefficient of thermister Study of energy band gap of a semiconductor Determination of Planck constant (h) by LED Comparison of capacity by Method of mixture <p>Assignment of two marks questions and answers writing for each paper as a best practices. To conduct first & second unit test on each unit.</p>	6
March 2021	<p>Unit II Logic Gates AND gate, OR gate, NOT gate, NAND gate, NOR gate, EX-OR and EX-NOR gates, Universal properties of NAND and NOR gates. Boolean operations, logic expressions for 2,3 & 4 inputs, laws of Boolean algebra, De -Morgen's theorems, SOP form of Boolean expressions, simplification of Boolean expressions using K- maps (up to 4 variables), Half adder, Full adder</p> <p>Practicals</p> <ol style="list-style-type: none"> I-H curve by Magnetometer method To measure resistivity of semiconductor by four probe method Determination of crystal structure using Laue pattern Determination of crystal structure by rotating crystal method Verification of truth table of basic gates (AND, OR, NOT) using ICs. Construction of basic gates (AND, OR, NOT) using NAND gates. Construction of basic gates (AND, OR, NOT) using NOR gates Construction and study of half adder using NAND gates. Construction and study of full adder using NAND gates. <p>Assignment of two marks questions and answers writing for each papers as a best practices. To conduct second, third & fourth unit test on each unit.</p>	10
April 2021	<p>Unit III Modulation and Demodulation Introduction, Types of Modulation, Expression for A. M. voltage, AM waves, Frequency spectrum of AM wave, Power Output in AM, Expression for frequency modulated voltage, Principle of demodulation, linear diode AM detector or demodulator.</p>	12
May 2021	<p>Unit IV Communication Electronics: Introduction, Block diagram of basic communication system, Essential elements of A.M. Transmitter. A.M. receiver: Turned Radio' Frequency (TRF) Receiver, Super heterodyne receiver, Characteristics of radio receivers: sensitivity, selectivity, fidelity & their measurements</p> <p>Practicals</p> <ol style="list-style-type: none"> Implementation of Boolean expression from the given truth table using Kmap. Study of Colpits oscillator Study of Hartley Oscillator 	10

	<p>21. Study of low pass and high pass filter using resistance and capacitance</p> <p>22. Clipper and Clamper circuits</p> <p>23. Study of A.M. Modulator</p> <p>24. Study of A.M. Demodulator</p> <p>Assignment of two marks questions and answers writing for each papers as a best practices. To conduct fourth unit test on each unit. Up to second week of this month one- one unit of each papers complete(unite fourth for each paper), and assigned best practices for students write two marks questions and answers writing for each papers. Completed 8-9 practicals of T.Y. conduct fourth unit test on each unite. And at third week university exams stars.</p>	
June 2021	University exams of B.SC TY students.	


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DEPARTMENT OF PHYSICS

Class: B.SC S.Y

Title of the Paper & No.: Electromagnetic Theory & Relativity (P-VII) Optics and Laser (P-VIII)

Name of the Teacher: Mr. Umesh. Makode (CHB)

ANNUAL TEACHING PLAN 2020-2021

Month	Course content	Expected Periods
Sept 2020	Online Mode Teaching 3 rd week colleges starts new academic year 2020-2021 at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. S.Y students Unit I Statistical Basis and Thermodynamics Statistical Basis, probability, probability and frequency, permutation and combinations, Micro and Macro states, Thermodynamic probability, Entropy & probability	
Oct 2020	Unit—II: Classical Statistics and Quantum Statistics Phase space, Maxwell-Boltzmann Distribution law, Quantum Statistics- Bose-Einstein Distribution law, Fermi- Dirac Distribution law, comparison of M. B., B.E. and F. D. statistics, Application of Quantum statistics to Photon gas and Electron	04
Nov 2020	Diwali Vacation	
Nov 2020	Unit III Electromagnetic Theory and Maxwell's Equations Ampere's Law and Steady State current, Generalization of Ampere's Law and displacement current, Maxwell's Equations, Derivation of Maxwell's Equations, The electromagnetic Energy and Poynting Vector, The wave Equation.	13
Dec 2020	Unit IV Relativity Introduction, frame of reference, Postulates of Special Theory of Relativity, Galilean Transformations, Lorentz Transformations, Length Contraction, Time dilation, Velocity addition, relativity of mass; Mass energy relation	11
Jan 2021	SEC I:Electrical Measurements SEC-I Skill Enhancement Course I Electrical Measurements UNIT-I Basic of Measurement Instruments accuracy, Precision, Sensitivity, Resolution range, Errors in measurements, Loading effect. UNIT-II Multimeter Principle of measurement of dc voltage and dc current, ac voltage, ac current, Resistance, Specifications of a Multimeter and their significance. UNIT-III Voltmeter Principles of voltage measurement (block diagram only), Sensitivity, Specifications of an electronic	12

	voltmeter and its significance, Ac millivoltmeter, Types of ac millivoltmeter. UNIT-IV Milliammeters Principle of current measurement, Measurements of dc current, Ac current, Micro ammeters	
Feb 2021	UNIT-V Impedance Bridges Block diagram of bridge, Working principles of basic (balancing type) RLC bridge, Specifications of RLC bridge.	6
Feb 2021	University exams of B.SC SY students	
Feb 2021	Unit-I: Geometrical Optics Cardinal Points of an Optical System(six points), Coaxial Lens System (equivalent focal length and cardinal points), Huygens Eyepiece, Ramsden Eyepiece and their cardinal points,	6
March 2021	Unit-II: Interference and Diffraction: Newton's Rings, Determination of wavelength of Sodium light, Michelson Interferometer, Determination of wavelength of monochromatic light, Difference in wavelength between two neighboring spectral lines. Diffraction: Fresnel and Fraunhofer diffraction, Fraunhofer's diffraction due to single and double slit, Plane diffraction grating, Determination of wavelength of Sodium light, Rayleigh criterion, Resolving Power of grating, Resolving power of Prism.	11
April 2021	Unit-III: Polarization of Light Polarization by Reflection, Brewster's law, Malus law, Double refraction, Nicol prism, Nicol prism as an analyzer, Huygen's explanation of double Refraction in Uniaxial crystals, Quarter wave plate, Half wave plate, Optical Activity , Specific rotation, Laurent's half shade polarimeter.	13
May 2021	UNIT-III: Laser: Lasers, spontaneous and stimulated emission, Theory of laser action, Einstein's coefficients, Light amplification, Characterization of laser beam, He-Ne laser, Semiconductor lasers	12
June 2021	University exams start of B.SC SY students.	

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DEPARTMENT OF PHYSICS

Class: B.SC F.Y

Title of the Paper & No.: Mathematical Methods in Physics and Heat and Thermodynamics,
& Practical Paper II, III

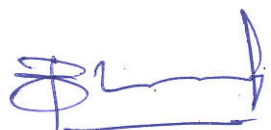
Name of the Teacher: Mr. Umesh. Makode (CHB)

ANNUAL TEACHING PLAN 2020-2021

Month	Course content	Expected Periods
Oct 2020	Last week colleges starts new academic year 2020-2021 at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. F.Y students	03
Nov 2020	Diwali Vaction	
Nov 2020	Unit I: Complex variables Introduction, Definition, complex algebra (Addition, Subtraction, Multiplication, Division, conjugate complex number), Argand diagram, Graphical representation of Sum, Difference, product and Quotient of complex number, Properties of moduli, arguments and geometry of complex numbers, Rectangular, polar and exponential form of complex numbers.	12
Dec 2020	Unit-II: Vector Analysis Introduction to Scalars, Vectors, Dot products and Cross Product of two vectors, Vector triple product, Scalar triple product, Scalar and vector field, Gradient of a scalar field, Divergence of a vector field and Curl of a vector field and their Physical interpretation, Laplacian Operator (∇^2), Line integral, Surface integral, Volume integral, Gauss's divergence theorem, Stoke's theorem, (Statements only), Vector identities.	15
Jan 2021	Unit -III: Partial Differentiation Definition of Partial Differentiation, Order or Successive Differentiation, total Differentiation and Chain rule, Change of variables from Cartesian to Polar Coordinates, Condition for maxima and minimum (without proof), Linear Homogeneous Partial differential equations with constant coefficients, Rules for finding the complementary function.	12
Feb 2021	Unit -IV: Fourier series Introduction of Periodic Functions, Definition of Fourier Series, Evaluation of the coefficients of Fourier series, Cosine series, Sine series, Dirichlet's Conditions, Graphical representations of even and odd functions, Advantages of Fourier series, Physical applications of Fourier series analysis: Square wave and half wave Rectifier.	10
Feb 2021	University exams of B.SC FY students and Diwali vacations	
Feb 2021	Unit-I: Thermometry Types of Thermometers, Centigrade and Fahrenheit scale, relation between Celsius, Kelvin, Fahrenheit & Rankine scales, Platinum resistance thermometer, Seebeck effect.	7

March 2021	Unit –II: Real Gases and Their Behavior Behavior of gases at high pressure, Boyle temperature, Andrew’s Experiment on CO ₂ , Amagat’s Experiment, Vander wall’s Equation of State, Critical Constants, Corresponding states, Coefficients of Vander wall’s Equation, Reduced Equation of State, Joule Thomson Porous Plug Experiment, Temperature of Inversion, Relation between Boyle temperature and Temperature of Inversion.	12
April 2021	Unit–III Transport Phenomenon in Gases Molecular Collisions, Mean free path, Expression for mean free path, Transport Phenomena, Viscosity of Gases, Thermal Conductivity of Gases, Diffusion, Inter relation between three transport coefficients	10
May 2021	Unit-IV: Thermodynamics and Thermodynamical Relations First Law of Thermodynamics, Relation connecting P, V and T in an Adiabatic Process, Second Law of Thermodynamics (Kelvin and Clausius statements), Carnot’s cycle, Carnot’s heat Engine, Carnot’s Theorem, Entropy, Entropy of Irreversible processes entropy of reversible process, Third Law of Thermodynamics. Internal energy, Helmholtz’ function, Enthalpy, Gibb’s function, Maxwell’s Thermodynamical Relations, T- dS equations, Clausius-Clapeyron latent heat equations. To assignment of MCQ questions and answers writing for papers as a best practices. To conduct fourth unit test. From third week university semester exams are starts	10
June 2021	University exams of B.SC FY students.	


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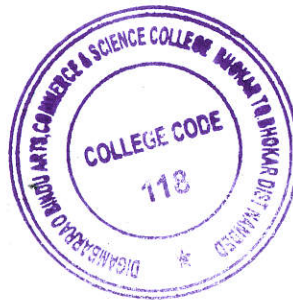
Department of Physics

Annual Teaching Plan for 2021-2022

Workload Distribution

Class	Teachers Name			
	Dr.Nemmaniwar B.G.		Mr. Makode U.G.	
	Theory	Practical	Theory	Practical
B.Sc. I Sem.-I	Paper-I	Paper-V	Paper-II	Paper-X & XI
B.Sc. I Sem.-II	Paper- III		Paper- IV	
B.Sc. II Sem.-III	Paper-VII	Paper-VI		
B.Sc. II Sem.-IV	Paper- IX	Paper-VIII		
B.Sc. III Sem.-V	Paper-XIII	Paper-XVI & XVII		
B.Sc. III Sem.-VI	Paper-XV		Paper-XIV	


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DEPARTMENT OF PHYSICS

Class: B.SC T.Y

Title of the Paper & No.: Quantum Mechanics and Atomic & Molecular Phy. XII and XIV XVI
(Practicales). SEC III & IV

Name of the Teacher: Dr. Nemmaniwar B.G.

ANNUAL TEACHING PLAN 2021-2022		
Month	Course content	Expected Periods
8 Sept To 19 Oct 2021	Online Mode Teaching 3 rd week colleges starts new academic year 2021-2022, at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. T.Y students. Unit I Particle Properties of Waves. Introduction, Photoelectric Effect Quantum Theory of Light, The Compton Effect, de Broglie waves, Wave function	16
20 Oct 2021	Off line Mode Taching de Broglie Wave Velocity, Wave and Group velocities, G. P. Thomson experiment, The Uncertainty principle and its applications. Unit II Schrödinger's Equation Introduction, Schrödinger's Equation: Time dependent form, Probability current, Expectation Values, Operators, Schrödinger's Equation: Steady-state form, Eigen values and Eigen functions, Problems	05
1 Nov to 15 Nov 2021	Diwali vacations	
16 Nov 2021	. SEC III (A) Skill Enhancement Course: A. Renewable Energy and Harvesting. Unit 1 Fossil Fuels and Alternate Sources of Energy Fossile fuels and Nuclear Energy, Need of renewable energy, Non-conventional energy sources, Wind Energy, Tidal Energy, Solar Energy, Biomass Energy. Starts Practical's 1. Coefficient of viscosity by oscillating disc method 2. Determination of Rydberg's constant 3. Hartmann's dispersion formula 4. Temperature of flame 5. Cauchy's constant by using spectrometer 6. Conductivity by Forbe's method	12
Dec 2021	Unit III Applications of Quantum Mechanics Introduction, The particle in a box: energy quantization, The particle in a box: wave functions, The particle in a box: Momentum Quantization, The Harmonic Oscillator, The Harmonic Oscillator-Energy level, The particle in a three dimensional box Unit 2 Solar Energy and Harvesling Importance, Storage of Solar Energy, Applications of Solar Energy, Solar Water	14

	<p>Heater, Solar Distillation, Solar Cooker, Solar Green houses, Solar cell characteristics of Photovoltaic (pv) Systems.</p> <p>Practicals</p> <p>7. Determination of Planck constant (h) by photo cell.</p> <p>8. e/m by Thomson's method</p> <p>9. Determination of resolving power of prism</p> <p>10. Diffraction at Cylindrical Object: Determination of Wavelength</p> <p>11. Thermal conductivity of an insulator by Lee's disc method.</p>	
10 Jan To 31 Jan 2022	<p>Online Mode Teaching</p> <p>Unit IV Quantum Theory of Hydrogen Atom Schrödinger's equation for the Hydrogen Atom in spherical polar co-ordinates, separation of Variables, Quantum numbers –Total quantum number, Orbital quantum number, Magnetic quantum number, spin quantum number.</p> <p>At last week to conduct second university internal exam</p> <p>Unit 3 Wind Energy Harvesling</p> <p>Fundameials of Wind Energy, Wind Turbines and Different Electrical Machines in Wind Turbines, Power Electronic Interfaces and Grid Interconnection Technologies.</p> <p>12. Resolving power of grating</p> <p>13. Y By Konings Method</p> <p>14. To Study the Spectral Characteristics of a photovoltaic solar cell</p> <p>15. To determine the wavelength of H-alpha emission line in Hydrogen spectrum</p>	12
1 Feb To 7 Feb 2022	<p>Off line Mode Taching</p> <p>Up to second week of this month one- one unit of each papers complete(unite fourth for each paper), and assigned best practices for students write two marks questions and answers writing for each papers. Completed 8-9 practical's of T.Y. conduct fourth unit test on each unit. And at third week university exams stars</p> <p>Unit 4 Ocean Energy</p> <p>Oscean Energy Potential against Wind and Solar Enevgy, Wave Energy Devices. Geothermal Energy Technologies, Hydropower Technologies</p> <p>Hands on Exercises:</p> <ol style="list-style-type: none"> 1. Studying basics of solar energy 2. Assemble solar cooker 3. Studying basics of solar electricity 4. Installation of solar panels and solar energy harvesting 5. Studying basics of Biomass Energy as an alternative source 6. Generating electricity from wind energy and its storage 7. Studying the construction and working of a solar lantern 8. Designing and constructing photovoltaic system for a domestic house requiring 5kVA power 9. Designing and constructing wind turbine system to power a house requiring 2kVA 	15
8 Feb to 23 Feb 2022	University exams of B.SC FY, SY, TY students. Sem I,III & V	
24 Feb 2022	<p>Last week of this month starts lecturers on B.SC T.Y students Papers XIV & XV.</p> <p>Unit I Atomic Physics The Vector Atom Model, Quantum numbers associated with the vector atom model, LS and J-J coupling, The Pauli's exclusion Principle, Selection rules, Intensity rules, Interval rule, Normal Zeeman effect, Anomalous Zeeman effect, Stark effect.</p>	14
March 2022	<p>Unit II Molecular Spectra Regions of Electromagnetic Spectra, Classification of Molecular Spectra, Theory of pure rotational spectra, Theory of rotation-vibration spectra, Raman Effect, Experimental study,</p>	12

	<p>SEC IV (A) Skill Enhancement Course</p> <p>Unit I Semiconductor Diodes Construction, working and characteristics of different types of P-N junction diodes, Construction, working and characteristics of Zener diode, Construction, working and characteristics of Photo diode and Varactor diode.</p> <p>Unit II Field Effect Transistors Construction, working and characteristics of JFET, Construction, working and characteristics of MOSFET.</p> <p>Practical's</p> <ol style="list-style-type: none"> 1.To study the Hysteresis curve of the transformer core 2. Study of variation of thermo e.m.f. as a function of temperature 3. Study of CRO Measurement of frequency and voltage sensitivity 4. Determination of electrical conductivity of graphite rod 5. Determination of temperature coefficient of thermister 6. Study of energy band gap of a semiconductor 7. Determination of Planck constant (h) by LED 8. Comparison of capacity by Method of mixture <p>Assignment of two marks questions and answers writing for each paper as a best practices. To conduct first & second unit test on each unit</p>	
<p>April 2022</p>	<p>Unit III Particle Accelerators Need of particle accelerators, Van de Graff Generator, Linear accelerator, Cyclotron, Synchrotron, Betatron.</p> <p>SEC</p> <p>Unit III Rectifiers Block diagram of power supply, half wave rectifier, Full wave rectifier, ripple factor and efficiency of half and Full wave rectifiers</p> <p>Unit IV Thyristor and UJTs Construction, working and characteristics of SCR and Construction, working and characteristics of UJT.</p> <p>Practicals</p> <ol style="list-style-type: none"> 9. I-H curve by Magnetometer method 10. To measure resistivity of semiconductor by four probe method 11. Determination of crystal structure using Laue pattern 12. Determination of crystal structure by rotating crystal method 13. Verification of truth table of basic gates (AND, OR, NOT) using ICs. 14. Construction of basic gates (AND, OR, NOT) using NAND gates 15. Construction of basic gates (AND, OR, NOT) using NOR gates 16. Construction and study of half adder using NAND gates. 17. Construction and study of full adder using NAND gates. <p>Assignment of two marks questions and answers writing for each papers as a best practices. To conduct second, third & fourth unit test on each unit.</p>	<p>13</p>
<p>May 2022</p>	<p>Unit IV Nuclear Fission, Fusion and Nuclear Reactions Nuclear Fission, the fission products, energy release in fission, nuclear transmutations (by alpha particles, protons, deuterons and neutrons), conservation laws, Nuclear reaction kinematics Introduction to Nuclear fusion, thermo-nuclear reactor, the neutron cycle.</p> <p>SEC Hands on Exercises:</p> <ol style="list-style-type: none"> 1. Study and compare the V-I Characteristics of various types of P-N junction diodes (e.g. general purpose, LEDs, Zener Diode, etc.) 2. Study and compare the working of Photo diode and Varactor diode 3. Study and compare the working properties of the <i>n</i>-channel and <i>p</i>-channel JFETs 4. Study and compare the working properties of the <i>n</i>-channel and <i>p</i>-channel MOSFETs 	<p>10</p>

	<p>5. Construct and test the performance of a FET Amplifier</p> <p>6. Study the working of half wave rectifier and determine ripple factor for different R, L, C filters</p> <p>7. Study the working of full wave rectifier and determine ripple factor for different R, L, C filters</p> <p>8. Study of SCR characteristics</p> <p>9. Study of UJT characteristics</p> <p>10. Construct UJT based free running oscillator and change its frequency.</p> <p>11. Construct a test circuit of SCR using UJT triggering</p> <p>Practicals</p> <p>18. Implementation of Boolean expression from the given truth table using Kmap.</p> <p>19. Study of Colpits oscillator</p> <p>20. Study of Hartley Oscillator</p> <p>21. Study of low pass and high pass filter using resistance and capacitance</p> <p>22. Clipper and Clamper circuits</p> <p>23. Study of A.M. Modulator</p> <p>24. Study of A.M. Demodulator</p> <p>Assignment of two marks questions and answers writing for each papers as a best practices. To conduct fourth unit test on each unit.</p> <p>Up to second week of this month one- one unit of each papers complete (unit fourth for each paper), and assigned best practices for students write two marks questions and answers writing for each papers. Completed 8-9 practicals of T.Y. conduct fourth unit test on each unite. And at third week university exams stars.</p>	
2 June-2022	University exams of B.SC FY, SY, TY students. Sem II, IV & VI	

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DEPARTMENT OF PHYSICS

Class: B.SC S.Y

Title of the Paper & No.: Waves and Oscillation & Basic Electronics. VI & IX SEC I & II

Name of the Teacher: Dr. Nemmaniwar B.G.

ANNUAL TEACHING PLAN 2021-2022

Month	Course content	Expected Periods
8 Sept To 19 Oct 2021	<p>Online Mode Teaching 3 rd week colleges starts new academic year 2021-2022, at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. S.Y students</p> <p>Unit –I: Waves: Wave velocity and particle velocity, Differential equation of wave motion, Energy of a plane progressive wave, Equation of motion of a vibrating string, Velocity of transverse waves along a string, Frequency and period of vibration of a string</p>	25
20 Oct 2021	<p>Off Line Mode Teaching Skill Enhancement Course-I UNIT-I: Basic of Measurement: Instruments accuracy, Precision, Sensitivity, Resolution range, Errors in measurements, Loading effect. UNIT-II: Multimeter: Principle of measurement of dc voltage and dc current, ac voltage, ac current, Resistance, Specifications of a Multimeter and their Significance. To assignment questions and answers writing for each papers as a best practices. To conduct first unit test.</p>	04
1 Nov to 15 Nov 2021	Diwali vacations	
16 Nov 2021	<p>Unit—II: Stationary waves: Analytical treatment of stationary waves (closed end & open end pipe at the other end), Investigation of pressure and density changes at displacement Nodes and Antinodes, Distribution of Energy in a stationary wave, Energy is not transferred in a stationary waves.</p>	13
Dec 2021	<p>UNIT-III: Voltmeter: Principles of voltage measurement (block diagram only), Sensitivity Specifications of an electronic voltmeter and its significance, Ac mill voltmeter, Types of ac mill voltmeter. UNIT-IV: Milliammeters: Principle of current measurement, Measurements of dc current, Ac current, Micro ammeters At last week to conduct first university internal exam, to assignment of MCQ questions and answers writing for each papers as a best practices. To conduct second unit test.</p>	12

10 Jan To 31 Jan 2022	<p>Online Mode Teaching</p> <p>Unit - III: Free and Forced Vibrations: Free Vibrations, Forced Vibrations, Resonance, Oscillatory Motion of a particle from energy considerations, Damped simple harmonic motion, Aperiodic, Critically Damped Oscillatory Motions, Effect of damping on Frequency, Forced Vibrations, resonance and Sharpness of resonance.</p> <p>UNIT-V: Impedance Bridges: Block diagram of bridge, Working principles of basic (balancing type) RLC bridge, Specifications of RLC bridge.</p> <p>UNIT-VI: Digital Instruments: Principle and working of digital meters, Comparison of analogue and digital instruments, Characteristics of digital meter, Working principle of digital voltmeter, Block diagram and working of digital Multimeter.</p> <p>At last week to conduct second university internal exam. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct third unit test.</p>	12
1 Feb To 7 Feb 2022	<p>Unit –IV: Acoustics and Ultrasonics: Reverberation, Reverberation time, Derivation of Reverberation Time (Sabine’s formula), Absorption coefficient, Determination of absorption Coefficient (reverberation Chamber Method), Conditions for good acoustical designs of auditorium, Ultrasonics, Piezo-electric & magnetostriction effect, Piezoelectric Oscillator, magnetostriction oscillator, Detection of ultrasonic waves: Acoustic grating</p> <p>Hands on Exercises:</p> <ol style="list-style-type: none"> 1. Measurement of ac and dc voltages by using analogue multimeter. 2. Measurement of resistance using colour code and analogue multimeter. 3. Measurement of ac and dc currents by using multimeter. 4. Measurement of ac and dc voltages by using AC/DC Voltmeters. 5. Measurement of ac and dc currents by using AC/DC Milliammeters. 6. Determination of value of L and C using bridge circuit. 7. Measurement of ac and dc voltages by using digital multimeter. 8. Measurement of resistance using digital multimeter. 9. To study testing of diode and transistor with multimeter. <p>Conduct unit test. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct fourth unit test. And at third week university exams stars</p>	12
8 Feb To 23 Feb 2022	University exams of B.SC FY, SY & TY students Sem I, III & V	
24 Feb 2022	<p>Unit I: Semiconductor Semiconductor, Types of Semiconductor, p-N Junction diode, Zenor diode, light emitting diode, Photodiode, Varactor diode and their V/I characteristics</p> <p>SEC II UNIT-I: Refraction Through Lenses: Types of lenses, The sign convention, principal foci, Deviation produced by a thin lens, Power of a lens, Principal planes and focal planes, Dispersion by prism, Dispersive power, Huygens eyepiece, Ramsden eyepiece. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct first unit test.</p>	5
March 2022	<p>Unit–II Bipolar Junction Transistors (BJT): Transistor Connections: Common base, common emitter, common collector, Characteristics of common base, common emitter, common collector connections, Hybrid parameters (or h parameters) Determination of h-parameters, Analysis of common emitter amplifier and common collector amplifier using hparameters (current gain, voltage gain, power gain, input resistance and output resistance)</p>	14

	UNIT-II: Semiconductor Sources and Detectors: Construction of LED, Working principle of LED, Types of LED, Construction of LDR, Working principle of LDR, Construction of photovoltaic cell & it's working principle.	
April 2022	Unit-III: Operational Amplifier: Operational Amplifier, Basic circuit of differential amplifier, common Mode and differential mode signals, block diagram of Op-Amp, schematic symbol, ideal Characteristics, input offset voltage; input offset current, input bias current, input impedance, Output impedance, open loop gain, Slew rate, Inverting amplifier. At last week to conduct second university internal exam. To assignment of MCQ questions and answers writing for each papers as a best practices. To conduct third unit test.	15
May 2022	Unit IV: Sinusoidal Oscillators: Sinusoidal Oscillator, Types of sinusoidal Oscillators, Oscillatory circuit, Positive feedback Amplifier- Oscillator, Barkhausen Criterion, Hartley oscillator, Colpitt's oscillator, R-C Network, Phase shift oscillator Hands on Exercises: 1. Determination of focal length of a biconvex lens. 2. Determination of radius of curvature of a lens using a spherometer. 3. Determination of power of a lens. 4. Determination of the grating radial spacing of a compact disc (CD) by reflection using a laser source. 5. To find the width of the slit using diffraction pattern obtained by a laser. 6. To find angle of polarization using Brewster law. 7. To study V-I characteristics of LED. 8. Study the characteristics of solid state laser. 9. Study the characteristics of LDR. 10. Study characteristics of a photovoltaic cell. Conduct fourth unit test. To assignment of MCQ questions and answers writing for each papers as a best practices. & at third week university exams stars	12
2 June 2022	University exams starts of B.SC SY students. SEM II, IV & VI	

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DEPARTMENT OF PHYSICS

Class: B.SC F.Y

**Title of the Paper & No.: Mechanics & Properties of Matter, Electricity & Magnetism.
& Practical Paper I, IV & V**

Name of the Teacher: Dr. Nemmaniwar B.G.

ANNUAL TEACHING PLAN 2021-2022

Month	Course content	Expected Periods
20 Oct 2021	Last week colleges starts new academic year 2021-2022, at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. F.Y students	08
1 Nov to 15 Nov	Diwali vacations	
16 Nov 2021	<p>P-I Core Course: Mechanics and Properties of Matter</p> <p>Unit I: Mechanics Laws of Mechanics (Newton's Laws of Motion), Newton's Law of Gravitation, Kepler's Law of Planetary Motion, Gravitational Field, Gravitational Intensity, Gravitational Potential, Gravitational Potential energy, Conservation Law, Work, Power, Kinetic Energy (Work Energy Theorem), Conservation of energy for a particle energy function, Motion of a body near the surface of earth, Types of conservative and non- conservative forces</p> <p>(P-V) : Physics Practical Paper 1. Y- by Spiral spring. 2. η - by Spiral spring. 3. η - by Static torsion. To assignment of MCQ questions and answers writing for papers as a best practices. To conduct first unit test.</p>	12
Dec 2021	<p>Unit-II: Surface Tension Molecular Forces, Surface Tension & its explanation, Pressure difference across a curved surface, Expression for Excess Pressure inside a Spherical Drop and spherical Soap Bubble, Surface Tension by Jaeger's Method, Surface Tension by Ferguson Method.</p> <p>Practical Paper 4. η - by Maxwell's needle. 5. Y- by bending loaded at the middle. 6. Viscosity of given liquid by Poiseuille's method. To assignment of MCQ questions and answers writing for papers as a best practices. To conduct second unit test. At last week to conduct first university</p>	15

	internal exam	
Jan 2022	<p>Unit- III: Viscosity Introduction, Coefficient of Viscosity, Streamline flow, critical velocity, Reynolds Number & its significance, Bernoullies Theorem, Poiseuille's equation for the flow of liquid through a tube, Experimental determination of coefficient viscosity by Poiseuille's Method.</p> <p>Practical Paper 7. Surface Tension of liquid by Jaeger's method. 8. Determination of Viscosity of given liquid by Searle's Viscometer. 9. Field along the axis of Circular coil (Determination of radius of the coil) 10. Small resistance by Carry Fosters Bridge. To assignment of MCQ questions and answers writing for papers as a best practices. To conduct third unit test. At last week to conduct second university internal exam</p>	09
7 Feb 2022	<p>Unit- IV: Elasticity Introduction, Hooke's Law, Elastic Constants (Y, K & η), Poisson's Ratio, Twisting couple on a cylinder or a (wire), Torsional pendulum, Bending of Beam, Bending Moment, Cantilever (Weight of the beam is ineffective, Weight of the beam is effective), Depression of a Beam supported at the ends and loaded at the Centre, Determination of Y by bending of beam. To assignment of MCQ questions and answers writing for papers as a best practices. To conduct fourth unit test. From third week university semester exams are starts</p>	10
8 Feb to 23 Feb 2022	University exams of B.SC FY, SY & TY students	
24 Feb 2022	<p>P-IV Core Course: Electricity and Magnetism</p> <p>Unit- I: Electrostatics and Magnetostatics Concept of electric field, electric flux, Gauss's law, conservative nature of electric field, concept of electric potential, potential energy of a system of charges, energy density in an electric field. Concept of Magnetic Field (B) and magnetic flux (Φ), Lorentz Force, Force on a current carrying conductor, Biot and Savert's Law, Applications of Biot-Savert's law to straight and circular current carrying conductor, Amperes circuital law (Integral form), Curl of magnetic field (Amperes circuital law differential form). Motion of charged particles in uniform electric field, Motion of charged particle in magnetic field, Maxwell's displacement current.</p> <p>Practical Paper 11. Ballistic galvanometer (Figure of merit) 12. Comparison of capacity by Desauty Method 13. Determination of angle of Prism by Spectrometer To assignment of MCQ questions and answers writing for papers as a best practices. To conduct first unit test.</p>	6
March 2022	<p>Unit- II: Magnetization Introduction, Magnetic Induction (B), Flux density, Intensity of magnetization (I), Intensity of magnetizing field (H) Permeability, Susceptibility, Relation between Permeability and Susceptibility, Hysteresis curve, Brief introduction of ferromagnetic, paramagnetic and diamagnetic phenomenon, I-H curve By magnetometer method, Principle and construction of Moving coil type Ballistic Galvanometer with theory (q).</p> <p>Practical Paper</p>	15

	<p>14 Determination of Refractive Index of Prism by Spectrometer 15 Characteristics of P-N junction diode (forward and reverse) 16. Zener Diode Characteristics</p> <p>To assignment of MCQ questions and answers writing for papers as a best practices. To conduct second unit test. At last week to conduct first university internal exam</p>	
April 2022	<p>Unit- III: Time Varying (Dynamic) Fields (Waves) Definition of electromagnetic induction, Faradays Law of Electromagnetic Induction, Lenz's law, Self induction, Self induction of a Solenoid, Mutual induction, Mutual Induction of a pair of coil, Work done in establishing current in an inductance, Mutual inductance of a Co axial solenoids, Problems.</p>	11
May 2022	<p>Unit-IV: Alternating Current circuits Brief introduction to AC through Capacitor and Inductor, Nature of Impedance(z) and Reactance(x) of Inductance(z_L&x_L), Capacitance(z_C&x_C) and Resistance(z_R&x_R), Complex number and J-operator, Complex Impedance and reactance, Application of Complex numbers in solving AC Circuit (Not vector diagram), L-C-R (Series resonance and Parallel resonance) circuits. Power in AC circuit and Power Factor, Principle, working and types of transformers (step up and step down with figures), Current, voltage and turns ratio of transformer, Efficiency of transformer, AC bridges (Wheatstone bridge). To assignment of MCQ questions and answers writing for papers as a best practices. To conduct third unit test. At last week to conduct second university internal exam</p>	10
2 June 2022	University exams of B.SC FY, SY & TY students.	

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DEPARTMENT OF PHYSICS

Class: B.SC T.Y

Title of the Paper & No.: Solid State Physics XIV & XV Digital and Communication
Electronics Name of the Teacher: Dr. Nemmaniwar B.G.

ANNUAL TEACHING PLAN 2021-2022

Month	Course content	Expected Periods
8 Sept To 19 Oct 2021	<p>Online Mode Teaching 3 rd week colleges starts new academic year 2021-2022 at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. T.Y students.</p> <p>Unit I Crystal structure Introduction, Crystal Lattices and Translation vectors, Unit cell, Basis, Symmetry operations, Point groups, space group, Types of lattices, Simple crystal structure (HCP, FCC, BCC, SC), Structure of Diamond, NaCl, Problems.</p>	23
20 Oct 2021	<p>Unit II Bonding in Solids and X-Ray Diffraction Inter atomic forces and types of bonding, ionic bond, covalent bond, metallic bond, hydrogen bond, Vander-waal's bond. X-ray diffraction, Bragg's law, Laue's method, Rotating crystal method</p>	03
1 Nov to 15 Nov 2021	Diwali Vacations	
16 Nov 2021	<p>Unit III Thermal properties of Solids Specific heat of gases, Specific heat of solids, Classical theory of Lattice heat Capacity, Einstein's theory of heat Capacity, Debye's theory of specific heat of solids, Limitations of Debye model</p>	09
Dec 2021	<p>Practicals 1. Determination of Planck constant (h) by photo cell. 2. e / m by Thomson's method 3. Determination of resolving power of prism 4. Diffraction at Cylindrical Object: Determination of Wavelength 5. Thermal conductivity of an insulator by Lee's disc method.</p>	12
10 Jan 31 Jan 2022	<p>Online Mode Teaching Unit IV Free Electron Theory of Metals The outstanding properties of metals, Drude-Lorentz theory, Thermal conductivity, Electrical conductivity, Widemann- Franz relation, Sommerfeld Model, Electrical conductivity and Ohms law, Electronic specific heat, Thermoionic emission, escape of electrons from metal. 6. Resolving power of grating 7. Y By Konings Method 8. To Study the Spectral Characteristics of a photovoltaic solar cell 9. To determine the wavelength of H-alpha emission line in Hydrogen spectrum</p>	15
7 Feb	Up to second week of this month one- one unit of each papers complete(unite	10

2022	fourth for each paper), and assigned best practices for students write two marks questions and answers writing for each papers. Completed 8-9 practical's of T.Y. conduct fourth unit test on each unit, And at third week university exams stars	
8 Feb to 23 Feb 2022	University exams of B.SC T.Y students. Last week of this month starts lecturers on B.SC T.Y students Papers XIV.	
24 Feb 2022	<p>Unit I Number Systems Number System:- Decimal numbers, Binary numbers, Binary arithmetic, Ones complement representation, Twos complement representation, Octal Numbers, Hexadecimal numbers, Inter-conversions of number Systems, Binary coded decimal (BCD), Gray code, Excess-3 code.</p> <p>Practical's</p> <ol style="list-style-type: none"> To study the Hysteresis curve of the transformer core Study of variation of thermo e.m.f. as a function of temperature Study of CRO Measurement of frequency and voltage sensitivity Determination of electrical conductivity of graphite rod Determination of temperature coefficient of thermister Study of energy band gap of a semiconductor Determination of Planck constant (h) by LED Comparison of capacity by Method of mixture <p>Assignment of two marks questions and answers writing for each paper as a best practices. To conduct first & second unit test on each unit.</p>	6
March 2022	<p>Unit II Logic Gates</p> <p>AND gate, OR gate, NOT gate, NAND gate, NOR gate, EX-OR and EX-NOR gates, Universal properties of NAND and NOR gates. Boolean operations, logic expressions for 2,3 & 4 inputs, laws of Boolean algebra, De -Morgen's theorems, SOP form of Boolean expressions, simplification of Boolean expressions using K- maps (up to 4 variables), Half adder, Full adder</p> <p>Practicals</p> <ol style="list-style-type: none"> I-H curve by Magnetometer method To measure resistivity of semiconductor by four probe method Determination of crystal structure using Laue pattern Determination of crystal structure by rotating crystal method Verification of truth table of basic gates (AND, OR, NOT) using ICs. Construction of basic gates (AND, OR, NOT) using NAND gates Construction of basic gates (AND, OR, NOT) using NOR gates Construction and study of half adder using NAND gates. Construction and study of full adder using NAND gates. <p>Assignment of two marks questions and answers writing for each papers as a best practices. To conduct second, third & fourth unit test on each unit.</p>	10
April 2022	<p>Unit III Modulation and Demodulation</p> <p>Introduction, Types of Modulation, Expression for A. M. voltage, AM waves, Frequency spectrum of AM wave, Power Output in AM, Expression for frequency modulated voltage, Principle of demodulation, linear diode AM detector or demodulator.</p>	12
May 2022	<p>Unit IV Communication Electronics:</p> <p>Introduction, Block diagram of basic communication system, Essential elements of A.M. Transmitter. A.M. receiver: Turned Radio Frequency (TRF) Receiver, Super heterodyne receiver, Characteristics of radio receivers: sensitivity, selectivity, fidelity & their measurements</p> <p>Practicals</p> <ol style="list-style-type: none"> Implementation of Boolean expression from the given truth table using Kmap. 	10

	<p>19. Study of Colpits oscillator 20. Study of Hartley Oscillator 21. Study of low pass and high pass filter using resistance and capacitance 22. Clipper and Clamper circuits 23. Study of A.M. Modulator 24. Study of A.M. Demodulator</p> <p>Assignment of two marks questions and answers writing for each papers as a best practices. To conduct fourth unit test on each unit. Up to second week of this month one- one unit of each papers complete(unite fourth for each paper), and assigned best practices for students write two marks questions and answers writing for each papers. Completed 8-9 practicals of T.Y. conduct fourth unit test on each unite. And at third week university exams stars.</p>	
2 June 2022	University exams of B.SC TY students.	



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DEPARTMENT OF PHYSICS

Class: B.SC S.Y

Title of the Paper & No.: Electromagnetic Theory & Relativity (P-VII) Optics and Laser (P-VIII)

Name of the Teacher: Mr. Umesh. Makode-(CHB)

ANNUAL TEACHING PLAN 2021-2022

Month	Course content	Expected Periods
8 Sept To 19 Oct 2021	Online Mode Teaching 3 rd week colleges starts new academic year 2021-2022 at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. S.Y students Unit I Statistical Basis and Thermodynamics Statistical Basis, probability , probability and frequency, permutation and combinations, Micro and Macro states, Thermodynamic probability, Entropy & probability	
20 Oct 2021	Unit—II: Classical Statistics and Quantum Statistics Phase space, Maxwell-Boltzmann Distribution law, Quantum Statistics- Bose-Einstein Distribution law, Fermi- Dirac Distribution law, comparison of M. B., B.E. and F. D. statistics, Application of Quantum statistics to Photon gas and Electron	04
1 Nov To 15 Nov 2021	Diwali Vacation	
16 Nov 2021	Unit III Electromagnetic Theory and Maxwell's Equations Ampere's Law and Steady State current, Generalization of Ampere's Law and displacement current, Maxwell's Equations, Derivation of Maxwell's Equations, The electromagnetic Energy and Poynting Vector, The wave Equation.	13
Dec 2021	Unit IV Relativity Introduction, frame of reference, , Postulates of Special Theory of Relativity, Galilean Transformations, Lorentz Transformations, Length Contraction, Time dilation, Velocity addition, relativity of mass, Mass energy relation	11
Jan 2022	SEC I:Electrical Measurements SEC-I Skill Enhancement Course I Electrical Measurements UNIT-I Basic of Measurement Instruments accuracy, Precision, Sensitivity, Resolution range, Errors in measurements, Loading effect. UNIT-II Multimeter Principle of measurement of dc voltage and dc current, ac voltage, ac current, Resistance, Specifications of a Multimeter and their significance. UNIT-III Voltmeter	12

	Principles of voltage measurement (block diagram only), Sensitivity, Specifications of an electronic voltmeter and its significance, Ac millivoltmeter, Types of ac millivoltmeter. UNIT-IV Milliammeters Principle of current measurement, Measurements of dc current, Ac current, Micro ammeters	
7 Feb 2022	UNIT-V Impedance Bridges Block diagram of bridge, Working principles of basic (balancing type) RLC bridge, Specifications of RLC bridge.	6
8 Feb to 23 Feb 2022	University exams of B.SC SY students	
24 Feb 2022	Unit-I: Geometrical Optics Cardinal Points of an Optical System (six points), Coaxial Lens System (equivalent focal length and cardinal points), Huygens Eyepiece, Ramsden Eyepiece and their cardinal points,	6
March 2022	Unit-II: Interference and Diffraction: Newton's Rings, Determination of wavelength of Sodium light, Michelson Interferometer, Determination of wavelength of monochromatic light, Difference in wavelength between two neighboring spectral lines. Diffraction: Fresnel and Fraunhofer diffraction, Fraunhofer's diffraction due to single and double slit, Plane diffraction grating, Determination of wavelength of Sodium light, Rayleigh criterion, Resolving Power of grating, Resolving power of Prism.	11
April 2022	Unit-III: Polarization of Light Polarization by Reflection, Brewster's law, Malus law, Double refraction, Nicol prism, Nicol prism as an analyzer, Huygen's explanation of double Refraction in Uniaxial crystals, Quarter wave plate, Half wave plate, Optical Activity, Specific rotation, Laurent's half shade polarimeter.	13
May 2022	UNIT-III: Laser: Lasers, spontaneous and stimulated emission, Theory of laser action, Einstein's coefficients, Light amplification, Characterization of laser beam, He-Ne laser, Semiconductor lasers	12
2 June 2022	University exams start of B.SC SY students.	

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DEPARTMENT OF PHYSICS


Class: B.SC F.Y


Title of the Paper & No.: Mathematical Methods in Physics and Heat and Thermodynamics.
& Practical Paper II, III

Name of the Teacher: Mr. Umesh. Makode (CHB)

ANNUAL TEACHING PLAN 2021-2022		
Month	Course content	Expected Periods
20 Oct 2021	Last week colleges starts new academic year 2021-2022 at last week prior to start of syllabus lecturer on preparation of JAM, ISEER, IIT & other national level institutes for M.SC Physics examinations. Then starts lecturer on B.SC. F.Y students	03
1 Nov to 15 Nov 2021	Diwali Vaction	
16 Nov 2021	Unit I: Complex variables Introduction, Definition, complex algebra (Addition, Subtraction, Multiplication, Division, conjugate complex number), Argand diagram, Graphical representation of Sum, Difference, product and Quotient of complex number, Properties of moduli ,arguments and geometry of complex numbers, Rectangular, polar and exponential form of complex numbers.	12
Dec 2021	Unit-II: Vector Analysis Introduction to Scalars, Vectors, Dot products and Cross Product of two vectors, Vector triple product, Scalar triple product, Scalar and vector field , Gradient of a scalar field , Divergence of a vector field and Curl of a vector field and their Physical interpretation , Laplacian Operator (∇^2), Line integral, Surface integral, Volume integral, Gauss's divergence theorem, Stoke's theorem, (Statements only), Vector identities.	15
Jan 2022	Unit -III: Partial Differentiation Definition of Partial Differentiation, Order or Successive Differentiation, total Differentiation and Chain rule, Change of variables from Cartesian to Polar Co-ordinates, Condition for maxima and minimum (without proof), Linear Homogeneous Partial differential equations with constant coefficients, Rules for finding the complementary function.	12
7 Feb 2022	Unit -IV: Fourier series Introduction of Periodic Functions, Definition of Fourier Series, Evaluation of the coefficients of Fourier series, Cosine series, Sine series, Dirichlet's Conditions, Graphical representations of even and odd functions, Advantages of Fourier series, Physical applications of Fourier series analysis: Square wave and half wave Rectifier.	10
8 Feb to 23 Feb 2022	University exams of B.SC FY students and Diwali vacations	
24 Feb	Unit-I: Thermometry	7

2022	Types of Thermometers, Centigrade and Fahrenheit scale, relation between Celsius, Kelvin, Fahrenheit & Rankine scales, Platinum resistance thermometer, Seebeck effect.	
March 2022	Unit –II: Real Gases and Their Behavior Behavior of gases at high pressure, Boyle temperature, Andrew’s Experiment on CO ₂ , Amagat’s Experiment, Vander wall’s Equation of State, Critical Constants, Corresponding states, Coefficients of Vander wall’s Equation, Reduced Equation of State, Joule Thomson Porous Plug Experiment, Temperature of Inversion, Relation between Boyle temperature and Temperature of Inversion.	12
April 2022	Unit–III Transport Phenomenon in Gases Molecular Collisions, Mean free path, Expression for mean free path, Transport Phenomena, Viscosity of Gases, Thermal Conductivity of Gases, Diffusion, Inter relation between three transport coefficients	10
May 2022	Unit-IV: Thermodynamics and Thermodynamical Relations First Law of Thermodynamics, Relation connecting P, V and T in an Adiabatic Process, Second Law of Thermodynamics (Kelvin and Clausius statements), Carnot’s cycle, Carnot’s heat Engine, Carnot’s Theorem, Entropy, Entropy of Irreversible processes entropy of reversible process, Third Law of Thermodynamics. Internal energy, Helmholtz’ function, Enthalpy, Gibb’s function, Maxwell’s Thermodynamical Relations, T- dS equations, Clausius-Clapeyron latent heat equations. To assignment of MCQ questions and answers writing for papers as a best practices. To conduct fourth unit test. From third week university semester exams are starts	10
2 June 2022	University exams of B.SC FY students.	

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