BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 108
B.Sc. PHYSICS
(CBCS Syllabus for UG students admitted from academic the year 2019-20)

SEMESTER I

Part	Course Component	Code	Title	Credit	Hrs /week	ESE	CIA	Total
I	Lang	19LAA/ LBA/LCA	Language Paper I	3	6	75	25	100
II	Eng	19GEA	English Paper I	3	4	75	25	100
III	Core T-1	19CBA	Properties of Matter and Acoustics	5	6	75	25	100
III	P-1	19CB1	Practical Paper I	-	3	-	-	-
III	Allied AT-1	19ABA	Allied Physics for Mathematics Paper I	3	3	75	25	100
	AP-1	19AB1	Allied Physics Practical for Mathematics	-	3	-	-	-
IV	SBE-1	19SZ1	English for communication-I	2	2	50	50	100
	EVS	19EVS	Environmental Studies	2	3	75	25	100

SEMESTER II

Part	Course Component	Code	Title	Credit	Hr /week	ESE	CIA	Total
I	Lang	19LAB/ LBB/LCB	Language Paper II	3	6	75	25	100
II	Eng	19GEB	English Paper II	3	4	75	25	100
III	Core T-2	19CBB	Mechanics	5	6	75	25	100
III	P-1	19CB1	Practical Paper I	5	3	60	40	100
III	Allied AT-2	19ABB	Allied Physics for Mathematics Paper II	3	3	75	25	100
	AP-1	19AB1	Allied Physics Practical for Mathematics	4	3	60	40	100
IV	SBE-2	19SZ2	English for communication-II	2	2	50	50	100
	VBE	19VBE	Value based Education	3	3	75	25	100

SEMESTER III

Part	Course Component	Code	Title	Credit	Hr /week	ESE	CIA	Total
I	Lang	19LAC/ LBC/LCC	Language Paper III	3	6	75	25	100
II	Eng	19GEC	English Paper III	3	6	75	25	100
III	Core T-3	19CBC	Heat and Thermodynamics	5	5	75	25	100

III	P-2	19CB2	Practical Paper II	-	3	-	-	-
	Allied AT-3	19ABC	Allied Physics for Chemistry Paper I	3	3	75	25	100
	AP-2	19AB2	Allied Physics Practical for Mathematics	-	3	-	-	-
IV	SBE-3	19SZ3	Computing skills	2	2	75	25	100
	NME -I	19NB1	Fundamental Physics I	2	2	75	25	100

SEMESTER IV

Part	Course Component	Code	Title	Credit	Hr /week	ESE	CIA	Total
I	Lang	19LAD/ LBD/LCD	Language Paper IV	3	6	75	25	100
II	Eng	19GED	English Paper IV	3	6	75	25	100
III	Core T-4	19CBD	Electricity and Electromagnetism	5	5	75	25	100
III	P-2	19CB2	Practical Paper II	5	3	60	40	100
III	Allied AT-4	19ABD	Allied Physics for Chemistry Paper II	3	3	75	25	100
	AP-2	19AB2	Allied Physics Practical for Mathematics	4	3	60	40	100
IV	SBE-4 Per. Devlp.	19SZE	Personality development	2	2	75	25	100
	NME-II	19NB2	Fundamental Physics II	2	2	75	25	100
	Ext.Act	-	Extension Activity	3	-	-	-	-

SEMESTER V

Part	Course Component	Code	Title	Credit	Hr /week	ESE	CIA	Total
III	Core T-5	19CBE	Optics and Spectroscopy	5	5	75	25	100
	T-6 T-7	19CBF	Classical, Quantum and statistical mechanics	5	5	75	25	100
	T-8	19CBG	Mathematical Physics and Numerical methods	5	5	75	25	100
		19CBH	Atomic Physics	4	4	75	25	100
	P-3	19CB3	Practical Paper III	-	3	-	-	-
	P-4	19CB4	Practical Paper IV	-	3	-	-	-
	Core Elect. E-1	19EBA	Analog and Communication electronics	5	5	75	25	100

SEMESTER VI

Part	Course Component	Code	Title	Credit	Hr /week	ESE	CIA	Total
III	Core T-9	19CBJ	Nuclear Physics and Relativity	5	6	75	25	100
	T-10	19CBK	Solid State Physics	5	6	75	25	100
	P-3	19CB3	Practical Paper III	5	3	60	40	100
	P-4	19CB4	Practical Paper IV	5	3	60	40	100
	Core Elect. E-2	19EBB	Digital electronics and Microprocessor	5	6	75	25	100
	Core Elect. E-3	19EBC	Contemporary Physics	5	6	75	25	100

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
CORE PAPER I - PROPERTIES OF MATTER & ACOUSTICS
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:6**	**SEMESTER**	**:I**
CREDITS	**:5**	**SUBJECT CODE**	**:19CBA**

Objective:

- To expose students to the fundamentals of properties of matter and sound.
- To have knowledge on properties of liquids and their determination.
- To understand the physics of sound and its applications
- To know the different methods of producing ultrasonic waves and its applications

UNIT – I ELASTICITY

Poisson's ratio – Work done in producing three types of strain – Twisting couple on a cylinder – Rigidity modulus by static torsion method – Torsion pendulum – Determination of rigidity modulus and moment of inertia by torsional oscillations. Bending of beams – Expression for internal bending moment – Cantilever – Uniform and Non uniform bending – Young's modulus by Koenig's method – I - form girders. (PROBLEM FROM THIS UNIT)

UNIT – II SURFACE TENSION

Surface tension – definition – Molecular forces – Explanation of surface tension on kinetic theory – Surface energy – work done in increasing the area of a surface – Excess pressure inside a curved liquid surface – Excess pressure inside a spherical and cylindrical drops and bubbles-drop weight method- - angle of contact-Quincke's method-variation of surface tension with temperature-experimental determination- Jaegar's method.

UNIT – III VISCOSITY

Viscosity of liquids – Coefficient of viscosity and its dimensions – Poiseuille's formula for the volume of liquid flowing through a capillary tube – Experimental determination of coefficient of viscosity of a liquid – Ostwald's Viscometer – Viscosity of highly viscous liquid – Stokes' method – Variation of viscosity of a liquid with temperature – Applications of Viscosity.

UNIT - IV WAVES & OSCILLATIONS

Simple Harmonic motion – Composition of two simple harmonic motions in the same straight line – Composition of two S.H.M. at right angles to each other – Lissajous figures – Free, Damped, Forced vibrations – Resonance - Sound waves – Transverse & Longitudinal waves – Expression for the velocity of sound in a string – Laws of Transverse waves – Sonometer – Determination of AC frequency using sonometer - Determination of frequency using Melde's apparatus-Decibels - Intensity levels - decibel-noise pollution.

UNIT – V ACOUSTICS AND ULTRASOUND

Acoustics of buildings – Reverberation time – Derivation of Sabine's formula – Absorption Coefficient – Ultrasonic Waves – Production by Piezoelectric method – Properties and applications.

Course outcome:

On completion of the course, the student will be able to

- identify the materials suitable for construction of buildings, based on the moduli of elasticity.
- have knowledge on properties of liquids and its determination.
- understand the physics of sound and its applications
- To know the different methods of producing ultrasonic waves and its applications
- the concepts of acoustic comfort and better understanding of the theories used in building acoustics

BOOKS FOR STUDY

1. Properties of matter - Brijlal & Subramanian
2. Properties of matter - Murugesan
3. Text book of Sound - Brijlal & Subramanian

BOOKS FOR REFERENCE

1. Elements of properties of matter - D.S.Mathur
2. Text book of Sound - Khanna and Badi
3. Fundamental of Physics - D.Halliday, R.Resnick & Walker

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
CORE PAPER II - MECHANICS
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:6**	**SEMESTER**	**:II**
CREDITS	**:5**	**SUBJECT CODE**	**:19CBB**

Objective

- To understand and define the laws involved in mechanics
- To give the students fundamental ideas on projectiles and impact of two spheres
- To learn conservation laws in collision experiments.
- To derive Bernoulli's principle and apply pressure-velocity relation in fluid flow in the field of fluid dynamics

UNIT – I PROJECTILES

Projectile – Angle of projection, trajectory – Range and time of flight – Equation for the parabolic path – Greatest height attained – Horizontal range – Time of flight - Maximum horizontal range - Range and time of flight on an inclined plane. (PROBLEM FROM THIS UNIT)

UNIT – II IMPULSE AND IMPACT

Collision – Elastic and inelastic collision – (Fundamental laws of impact) – Newton's law of impact – coefficient of restitution – Impact of a smooth sphere on a fixed plane – Direct impact between two smooth spheres – Oblique impact between two smooth spheres – Calculation of final velocities of the spheres – Loss of K.E due to impact.

UNIT – III RIGID BODY DYNAMICS

Moment of inertia – Physical significance of moment of inertia – Radius of gyration – moment of inertia of a (i), solid and Hollow sphere (ii) cylinder (iii) disc – Compound pendulum – Equivalent simple pendulum – Reversibility of center of oscillation and suspension – Bar pendulum – Determination of 'g' and radius of gyration of a bar pendulum.

UNIT – IV ROTATIONAL MOTION AND GRAVITATIONAL FORCE

Rotation of rigid bodies – kinetic energy of rotation – Kinetic energy of a body having both translating and rotatory motion – Acceleration of body rolling down an inclined plane.

Kepler's laws of gravitation – G by Boys' method –Acceleration due to gravity – Variation of g with altitude, depth and rotation of earth - Value of g at poles and equator. Gravitational field – Gravitational potential – Gravitational potential due to spherical shell and solid sphere (No derivation)

UNIT – V STATICS & HYDRODYNAMICS

Statics : General condition of equilibrium of rigid bodies – Centre of gravity of a system of a system of particles – C.G. of a tetrahedron, cone and hemisphere (solid and hollow)

Hydrodynamics: Equation of continuity of flow – Euler's equation for unidirectional flow – Bernoulli's theorem – Torricelli's theorem – Venturi meter – Pitot's tube.

Course outcome:

On completion of the course, the student will be able to

- Understand and define the laws involved in mechanics
- apply conservation laws in collision experiments.
- derive Bernoulli's principle and apply pressure-velocity relation in fluid flow in the field of fluid dynamics

BOOKS FOR STUDY

1. Mechanics – Part I and II by Narayanamoorthy, National Publishing Company.
2. Mechanics by D.S.Mathur, S.Chand& Co., 2nd Edition (2001).
3. Mechanics by P. Duraipandian, LaxmiDuraipandian, MuthamizhJayapragasam, S.Chand& Co., New Delhi (1988).
4. Properties of Matter by R.Murugeshan, S. Chand & Co., New Delhi (2001).

BOOKS FOR REFERENCE

1. Fundamentals of Physics by D. Halliday, R.Rensick and J. Walker, 6th edition, Wiley,NY (2001).
2. Mechanics – D.S. Mathur
3. Classical Mechanics – J. C. Upadhyaya

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
CORE PAPER III - HEAT AND THERMODYNAMICS
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:5**	**SEMESTER**	**:III**
CREDITS	**:5**	**SUBJECT CODE**	**:19CBC**

Objective:

- To learn experimental methods to determine the transmission of heat.
- To understand the laws of thermodynamics and their applications.
- To study Maxwell's thermo dynamical relations and their applications

UNIT – I CALORIMETRY

Specific heat capacity of solids and liquids by the method of mixtures – Barton's correction – Specific heat capacity of gases – Meyer's relation – Determination of C_p and C_v – Joly's differential steam calorimeter – Regnault's method – Calendar and Barne's method.

UNIT – II BEHAVIOUR OF REAL GASES

Equation of perfect gas – van der Waals equation of state – Definition and determination of critical constants – Joule Kelvin effect – Porous plug experiment – Relation between T_b, T_i and T_c – Liquefaction of air – Linde's process.

Change of state

Latent heat of fusion and vaporization – Melting point and Boiling point – Changes with pressure – Regelation – Superheating and Supercooling – Triple point (qualitative only)

UNIT – III TRANSFER OF HEAT

Thermal conduction

Co-efficient of thermal conductivity – Rectilinear flow of heat along a bar – Thermal conductivity of bad conductors – Lee's disc method.

Thermal Radiation

Black body radiation – Kirchhoff's laws of Heat radiation – Mathematical derivation of Stefan's law – Derivation of Newton's law of cooling from Stefan's law – Determination of Stefan's constants. (PROBLEM FROM THIS UNIT)

UNIT – IV THERMODYNAMICS

Zeroth, first law of thermodynamics – Isothermal and adiabatic processes – Adiabatic equation of a perfect gas – Work done during isothermal and adiabatic processes – Reversible and irreversible processes – Second law of thermodynamics – Heat engines – Carnot engine – Thermodynamic scale of temperature - Petrol and diesel engines – Entropy – Change of entropy in reversible and irreversible processes – Entropy of a perfect gas – TS diagram.

UNIT – V THERMODYNAMIC EQUATIONS AND APPLICATIONS

Maxwell's thermodynamic relations – T-ds equation – Clapeyron's and Clausius latent heat equations from Maxwell's thermodynamic relations –Gibb's Helmholtz's equation-Definition of free energy – Enthalpy – Gibb's potential – Third law of thermodynamics.

Course Outcomes:

On completion of the course, the student will be able to

- learn experimental methods to determine the transmission of heat.
- understand the laws of thermodynamics and their applications.
- analyze Maxwell's thermo dynamical relations and their applications

BOOKS FOR STUDY

1. Heat and thermodynamics – Brijlal and Subramaniam
2. Heat – Ananthakrishnan
3. Heat – J.B. Rajam

BOOKS FOR REFERENCE

1. Advanced level Physics – Nelkon and Parker
2. Mechanics - D. S. Mathur

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
CORE PAPER IV - ELECTRICITY AND MAGNETISM
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:5**	**SEMESTER**	**:IV**
CREDITS	**:5**	**SUBJECT CODE**	**:19CBD**

Objectives:

To provide comprehensive knowledge and understanding of the basics of Electricity and Magnetism. To expose the students to the applications of Electricity and Magnetism

UNIT – I ELECTROSTATICS

Electric intensity – Electric potential – Relation between potential and intensity – Potential and intensity due to electric dipole – Capacity – Capacitance of a spherical, parallel plate and cylindrical condensers – Energy of a charged capacitor – Loss of energy due to sharing of charges.

UNIT – II HEATING EFFECT OF ELECTRIC CURRENT

Thermoelectricity- Seebeck effect- laws of thermo e.m.f-– measurement of thermo e.m.f using potentiometer-Peltier effect-demonstration—Thomson effect-demonstration - thermodynamics of thermo couple –thermo electric diagram –uses-applications.

MAGNETIC EFFECT OF ELECTRIC CURRENT

Biot and Savart law – magnetic induction at a point due to a straight conductor carrying current - Magnetic field intensity at a point on the axis of a circular coil carrying current – Force on a straight current carrying conductor kept in a magnetic field – Moving coil Ballistic galvanometer – Theory and working.

UNIT III ELECTROMAGNETIC INDUCTION

Faraday's laws of electromagnetic induction – Lenz law – Self induction – Expression for self induction of a long solenoid – Mutual induction – Expression for mutual inductance between two solenoids – Coefficient of coupling – Experimental determination of absolute coefficient of mutual induction between two coils- Earth inductor-Theory and applications. (PROBLEM FROM THIS UNIT)

UNIT IV TRANSIENT CURRENT

Growth and decay of current in a circuit containing resistance and inductance – Growth and decay of charge in a circuit containing resistance and capacitance – Growth and decay of charge in a LCR circuit – Condition for the charge and discharge to be oscillatory – Frequency of Oscillation.

UNIT – V ALTERNATING CURRENT

Peak, average and RMS values of AC voltage and current – Power factor and current values in an AC circuit containing LR, CR, LC and LCR – Series and parallel resonant circuits – Power in an AC circuit – Wattless current – Transformer.

Course Outcomes:

On the completion of the course students will be able to:

- understand fundamental laws of electricity and magnetism, identify and explain thermal and magnetic effect of electric current, analyses and solves electrical circuits with dc and ac source.
- apply the knowledge of electricity and magnetism to technological advances.
- To develop problem solving skills.

BOOKS FOR STUDY

1. Electricity and Magnetism - M. Narayanamoorthy
2. Electricity and Magnetism - R. Murugesan
3. Electricity and Magnetism - Brijlal and Subramaniam
4. Electricity and Magnetism - K.K.Tewari

BOOKS FOR REFERENCE

1. Electricity and Magnetism - Vasudeva
2. Electricity and Magnetism - Sehgal, Chopra and Sehagal

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
CORE PAPER V - OPTICS AND SPECTROSCOPY
(For the students admitted from the year 2019– 20)

HOURS PER WEEK	**:5**	**SEMESTER**	**:V**
CREDITS	**:5**	**SUBJECT CODE**	**:19CBE**

Objective:

- To gain knowledge of geometric optics including aberrations in lens system.
- To study of phenomena interference, diffraction, and polarization and lay the foundation for an understanding of concepts such as as holograms, interferometers.
- To learn fundamental ideas of spectroscopy

UNIT I: GEOMETRICAL OPTICS

Lens – Spherical aberration in lenses – Methods of minimizing spherical aberration – chromatic aberration in lenses – condition for achromatism of two thin lenses (in and out of contact) –Aplanatic lens –Dispersion – Angular and Chromatic dispersion – combination of prisms to produce i)dispersion without deviation ii) deviation without dispersion –Eyepieces – Ramsden's and Huygens's eyepieces.

UNIT II: INTERFERENCE

Conditions for interference – Theory of interference fringes – interference due to reflected light (thin films) -colours of thin films – wedge shaped thin film – theory – determination of diameter of a thin wire by Air wedge – test for optical flatness – Newton's rings by reflected light – Determination of wavelength of light - Michelson's Interferometer – theory and its Application (Measurement of wavelength).

UNIT III: DIFFRACTION

Fresnel's diffraction –Rectilinear propagation of light – zone plate –action of zone plate -diffraction at circular aperture – opaque circular disc – Fraunhofer diffraction at single slit – Double slit – Plane diffraction grating – theory of plane transmission grating - experiment to determine wavelength(Normal incidence method) – resolving power– Rayleigh's criterion for resolution – resolving power of a telescope, microscope, prism, and a grating (NO DERIVATION) (PROBLEM FROM THIS UNIT)

UNIT IV: POLARISATION

Double refraction –Nicol Prism – Nicol Prism as polarizer and analyzer – Huygens's explanation of double refraction in uniaxial crystals– Cases where optics axis being in the plane of incidence, parallel and inclined to the crystal surface- Quarter wave plates and Half wave plates – Production and detection of plane, circularly and elliptically polarized light- Optical activity– Fresnel's explanation of optical activity – Specific rotatory power –Laurent's half shade polarimeter.

UNIT V: SPECTROSCOPY

Infrared spectroscopy – sources and detector – uses – ultraviolet spectroscopy – sources – quartz spectrograph - applications - Raman Spectroscopy – Quantum theory of Raman effect – applications – Nuclear magnetic resonance –Nuclear quadrupole resonance -– Electron spin resonance spectroscopies- (Qualitative study)

Course Outcomes:

On completion of the course the students will have:

- The knowledge of geometric optics is helps in the practical design of many optical systems and instruments including aberrations in lens system.
- The study of phenomena interference, diffraction, and polarization lays the foundation for an understanding of concepts such as as holograms, interferometers.
- The knowledge of Spectroscopy helps to extract the dynamic information about the molecule.

BOOKS FOR STUDY:

1. A text book of Optics – Subramanyam and Brijlal, S. Chand and co.., 25th Edition, New Delhi 2004.
2. Optics and Spectroscopy – R.Murugeshan, S. Chand and co., 6th Edition, New Delhi, 2008.
3. Elements of Spectroscopy – S.L. Gupta, V.Kumar and R.C.Sharma Pragati Prakashan, 13th Edition, Meerut, 1997.
4. Molecular structure and spectroscopy – G.Aruldhas, PHI Pvt Ltd, , II Edition, New Delhi, 2007.

BOOKS FOR REFERENCE:

1. Optics – Sathyaprakash, Ratan Prakashan Mandhir, VIIth Edition, New Delhi, 1990.
2. Introduction to Molecular Spectroscopy –C.N.Banwell,TMH publishing co. IV Edition, New Delhi, 2006.
3. Ajoy Ghatak, *Optics*, (TMH), New Delhi, Fourth edition, 2009.
4. Singh & Agarwal, *Optics and Atomic Physics*, Pragati Prakashan Meerut, Nineth edition, 2002.
5. Fundamentals of Physics, by D.Halliday, R. Resnick and J. Walker, Wiley, 6thEdition, New York (2001).

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
CORE PAPER VI – CLASSICAL, QUANTUM AND STATISTICAL MECHANICS
(For the students admitted from the year 2019– 20)

HOURS PER WEEK	**:5**	**SEMESTER**	**:V**
CREDITS	**:5**	**SUBJECT CODE**	**:19CBF**

Objective:

- To understand the mechanics of systems of particles and their equations of motion.
- To study the concept of statistics of molecules.

UNIT I: MECHANICS OF A SYSTEM OF PARTICLES

External and internal forces, centre of mass-Conservation of linear momentum-Conservation of angular momentum-Conservation of energy-work-energy theorem-Conservative forces-examples-Constraints-Types of constraints-Examples-Degree of freedom-Generalized coordinates (transformation equations)- Generalized velocities-Generalized Momentum.

UNIT II: LAGRANGIAN FORMULATIONS

Principle of virtual work, D'Alembert's principle, Lagrange's equation of motion for conservative and non-conservative systems-Simple applications-simple pendulum-Atwood's machine-compound pendulum- Hamilton's principle-Deduction of Lagrange's equation of motion from Hamilton's principle-Deduction of Hamilton's principle from D'Alembert's principle.

UNIT III: QUANTUM MECHANICS

Black body radiation-Wave-particle duality- De Broglie's hypothesis- Phase velocity and group velocity- Phase velocity of De Broglie's Waves- postulates of quantum mechanics- Physical interpretation of wave function —Wave function for a free particle-Time dependent Schrödinger wave equation- Time independent Schrödinger wave equation. (PROBLEM FROM THIS UNIT)

UNIT IV: APPLICATIONS

Particle in one dimensional box- wave equation- Energy Eigen value- Normalization of wave function and probability density- Simple Harmonic Oscillator-Wave equation-Wave functions- Probability density- Hydrogen atom- Wave equation- Separation of variables (No derivation, only solution)- Ground state of Hydrogen atom- Interpretation of Quantum numbers- Rigid rotator – Rotational energy levels(Qualitative study only).

UNIT V: STATISTICAL MECHANICS

Statistical mechanics-Definition of phase space- Ensembles-Classical Statistics - Maxwell-Boltzmann statistics- Quantum Statistics- Bose and Einstein Statistics-Fermi - Dirac statistics – Comparison of three statistics.

Course Outcomes:

On completion of the course the students will be able to

- Know the usage of Lagrangian and Hamiltonian Mechanics.
- Understand the principles of Quantum mechanics and solve problems.
- Apply the principles of statistical mechanics to selected problems.

BOOKS FOR STUDY

1. Quantum Mechanics - Bagde and Singh
2. Quantum Mechanics - Mathews and Venkatesan
3. Modern Physics – Murugeshan
4. Statistical mechanics – Sathyaprakash and Agarwal
5. J.C. Upadhyaya, July 2005, Classical Mechanics, Published by Himalya Publishing House, Mumbai

BOOKS FOR REFERENCE

1. Quantum Mechanics - S.L.Gupta and Kumar
2. Thermal and Statistical physics – Saha and Srivatsava
3. Gupta,B.D., Satyaprakash, 1991, Classical Mechanics, 9th ed., Kedarnath Ramnath Publ., Meerut.
4. Gupta, Kumar, Sharma, 2005, Classical Mechanics, PragatiPrakashan Publ., Meerut.

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
CORE PAPER VII – MATHEMATICAL PHYSICS AND NUMERICAL METHODS
(For the students admitted from the year 2019– 20)

HOURS PER WEEK	**:5**	**SEMESTER**	**:V**
CREDITS	**:5**	**SUBJECT CODE**	**:19CBG**

OBJECTIVES:

- To understand various approximation methods to find solution to problems which do not have exact solutions.
- To understand various concepts of mathematical Physics and solve problems.

UNIT I: VECTOR ANALYSIS

Scalar and Vector fields – Gradient of scalar field, divergence and curl of a vector function - Physical interpretations - Vector identities - Linear Velocity and angular momentum Vectors - Gauss divergence theorem – Stoke's theorem - Green's Theorem - Applications of Vectors – Equation of heat flow in solids.

UNIT II: ERRORS AND ROOT OF EQUATIONS

What is Numerical analysis-numbers and their a

ccuracy-errors-measurement of errors-round off error-truncation error-absolute error-relative error-percentage error-inherent error-accumulated error-general error formulae – Convergence.

Roots of equations - Iteration method - Newton-Raphson method - Bisection method.

UNIT-III: MATRIX AND LINEAR EQUATIONS

Introduction - Pivotal condensation method - System of linear equations-Cramer's rule - characteristics equation of a matrix - eigen values and eigenvectors - Gauss Elimination method - Gauss Seidal Iteration method - Gauss Jordan elimination method - Matrix Inversion method -Gauss Jordan Method .

UNIT-IV: INTERPOLATION, NUMERICAL DIFFERENTIATION & INTEGRATION

Linear Interpolation - Quadratic Interpolation - Lagrange's interpolation – Newton's forward and backward interpolation formula for equal intervals.

Numerical differentiation - approximation of derivatives using interpolation polynomials -Taylor series method.

Numerical Integration - Trapezoidal rule - Simpson's 1/3rd rule.

UNIT V: DIFFERENTIAL EQUATIONS

Introduction-Euler's method (Adams Bashforth first order method) - backward Euler method- Taylor's series method - Runge-kutta method - predictor corrector methods.

Course Outcomes:

On completion of the course the students will be able to

- solve problems using an appropriate mathematical or numerical method.

BOOKS FOR STUDY:

1. Vector Analysis - Shanthi Narayanan.
2. Mathematical Physics - SathyaPrakash
3. Introductory methods of numerical analysis - S.S. Sastry, Prentice Hall of India, New Delhi (2000).
4. Numerical methods - A. Singaravelu, Meenakshi Agency, Chennai (2001).

BOOKS FOR REFERENCE:

1. Mathematical Physics - B.D.Gupta
2. Numerical method in Science and Engineering - M.K. Venkataraman, PHI -New Delhi (1997).
3. Mechanics and Mathematical methods, R. Murugesan, S. Chand & Co, NewDelhi (1999).
4. Numerical methods by P. Kandasamy, K. Thilagavathy and K. Gunavathy, S. Chand& Co. (2002).

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
CORE PAPER VIII – ATOMIC PHYSICS
(For the students admitted from the year 2019– 20)

HOURS PER WEEK	**:4**	**SEMESTER**	**:V**
CREDITS	**:4**	**SUBJECT CODE**	**:19CBH**

OBJECTIVES:

- To provide an introductory account about the atomic structure.
- To understand various concepts such as photo electric effect, positive rays, etc.

UNIT – I POSITIVE RAY ANALYSIS

Properties of positive rays- Positive ray Analysis- Isotopes- Aston's Mass Spectrograph- Bain Bridge's Mass Spectrograph- Dempster's Mass Spectrograph. (PROBLEM FROM THIS UNIT)

UNIT – II PHOTOELECTRIC EFFECT

Introduction –Lenard's method to determine e/m for photoelectrons- Richardson & Compton experiment- Experimental investigations on the photoelectric effect- Einstein's photoelectric Equation- Photo electric cell.

UNIT – II RELATIVISTIC ATOM MODEL

Earlier atom models – Thomson's atom model, Rutherford's atom model, Bohr's atom model (No derivation) – Sommerfeld's relativistic atom model – Elliptic orbits – Relativistic variation of electronic mass – Application to fine structure of H_α line.

UNIT – III VECTOR ATOM MODEL

Spatial quantization – Spinning of electron – Quantum numbers associated with vector atom model – Coupling schemes – Pauli's exclusion principle – Selection rules - Applications of the vector atom model – Electronic structure – Examples of electronic configuration – Magnetic moments due to orbital motion and electron spin – Bohr magneton – Experimental conformity of the vector atom model – Stern and Gerlach experiment with principle, experimental procedure and interpretation of result.

UNIT – V APPLICATIONS BASED ON ATOM MODELS

Excitation and ionization potential – Franck and Hertz experiment – Davis and Goucher's experiment.

Zeeman effect – Debye's explanation to Normal Zeeman effect – Anomalous Zeeman effect – Theoretical explanation – Lande 'g' factor – Paschen back effect – Stark effect (No Proof)

Course Outcomes:

On completion of the course the students will

- Understand the evolution of Different atomic models and their merit and limitations
- Have adequate knowledge on the fundamental principles governing the structure of the atom and the interactions of particles at high energies.
- Possess sufficient knowledge in atomic physics to follow courses at the advanced level.

BOOKS FOR STUDY

1. Atomic Physics – J.B. Rajam
2. Atomic and nuclear physics – Little field and Thorley.
3. Modern Physics – R. Murugesan

BOOKS FOR REFERENCE

1. Concepts of modern Physics – A. Beiser
2. Modern Physics – Kenneth S. Krane

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
ELECTIVE PAPER I-OPTION I-ANALOG & COMMUNICATION ELECTRONICS
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:5**	**SEMESTER**	**:V**
CREDITS	**:5**	**SUBJECT CODE**	**:19EBA**

Objectives:

- To enable the students to understand the aspects of analog electronics in a lucid and comprehensive manner.
- To understand AM, FM and PM modulation and demodulation techniques.
- To learn the basic concepts of communication system.

UNIT I: SEMICONDUCTOR DIODES AND DEVICES

Introduction to junction formation – PNP-NPN transistor action, transistor biasing and need for biasing – and stabilization voltage divider bias- DC load line-operating point. Transistor CB and CE modes-characteristics - FET, MOSFET, UJT, SCR - construction and characteristics.

UNIT II: TRANSISTOR AND OPERATIONAL AMPLIFIER

Two port representation of a transistor- h parameter – AC equivalent circuit using h parameters-analysis of CE amplifier using h parameters, RC coupled amplifier - FET amplifier. (PROBLEM FROM THIS UNIT)

Operational Amplifier- characteristics-parameters-applications- Inverting amplifier -Non inverting amplifier - Voltage follower- Adder - Subtractor - Integrator –Differentiator.

UNIT III: OSCILLATORS AND MULTIVIBRATOR

Feedback principle - negative feedback - Barkhausen criterion - Phase shift and Wien Bridge oscillators using transistors – Expression for frequency- Multivibrators - Astable , Monostable multi vibrators using transistors - Schmitt trigger

UNIT IV: MODULATION AND DEMODULATION

Amplitude modulation - Frequency modulation, Phase Modulation and Pulse Width Modulation - Detectors of AM, FM, PM and PWM - Noise in Communication Systems - , Advantages and disadvantages of digital communication.

UNIT V: SATELLITE AND FIBRE OPTIC COMMUNICATION

Communication Satellite Systems - Telemetry - Tracking and Command System - Satellite Links - Commonly Used frequency in Satellite Communication - Multiple access - Error Detection. Basic Fibre Optic System - Advantages of Fibre Optic System - Propagation of light through fibre - Numerical aperture - Acceptance angle - Losses and distortion in optical fibres - Basic fibre Optical communication and links.

Course Outcomes:

On completion of the course the students will

- Possess sufficient knowledge on various semiconductor devices and their working.
- Have adequate knowledge on the fundamental principles of communication systems.

BOOKS FOR STUDY

1. Hand Book of Electronics by Gupta and Kumar - PragatiPrakashan – Meerut(2002).
2. Principles of Electronics by V.K. Mehta, Rohit Mehta S. Chand & Co.(2006).
3. Electronics by M. Arul Thalapathi, Comptek Publishers(2005).
4. Elements of Electronics by M.K.Bagde and Singh S.P., S. Chand & Co., NewDelhi(1990).
5. Applied Electronics by A. Subramanyam – National Publishing Co.(1997)
6. OP - AMPs and Linear Integrated Circuits by Ramakant A. Gayakwad, PrenticeHall of India(1994).
7. Introduction to Integrated Electronics by V.Vijayendran, S. Viswanathan (Printersand Publishers) Pvt. Ltd., Chennai(2005).

BOOKS FOR REFERENCE

1. Electronic Devices by Mittal.G.K., G.K. Publishers Pvt. Ltd., (1993).
2. Basic Electronics by B.L. Theraja, S. Chand & Co., (2008).
3. Solid State Electronics by Ambrose and Vincent Devaraj, Meera Publication.
4. Applied Electronics by R.S. Sedha, S. Chand & Co.(1990).
5. Linear Integrated Circuits by D. Roy Choudhury and Shail Jain - New AgeInternational (P) Ltd.(2003).
6. Electronics - Analog and Digital by I.J. Nagrath - Prentice - Hall of India, NewDelhi(1999).
7. Integrated Electronics by J.Millman and C.Halkias, Tata McGraw Hill, New Delhi(2001)

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600 108.
B.Sc. – PHYSICS
ELECTIVE PAPER I: Option Paper II–NANOPHYSICS
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:4**	**SEMESTER**	**:V**
CREDITS	**:4**	**SUBJECT CODE**	**:19EBB**

OBJECTIVES

- To create the basic knowledge in nano materials.
- To understand the scientific perspective of nanomaterials.
- To identify the techniques suitable for nanomaterial synthesis.
- To know the significance of nanomaterials.

UNIT I:Nanomaterials

History of Nanotechnology- Nanostructures- synthesis of oxide nano particles- Synthesis of semiconductor nano particles- Synthesis of metallic nano particles

UNIT II: Quantum Heterostructure

Super lattice- preparation of Quantum nanostructure- Quantum well laser- Quantum cascade laser-Quantum wire- Quantum dot- Application of Quantum dots.

UNIT III: Carbon Nanotubes

Discovery of Nanotubes- Carbon Allotropes- Types of carbon Nanotubes- Graphene sheet to a single walled nanotube- Electronic structure of Carbon Nanotubes- Synthesis of Carbon Nanotube.

UNIT IV

Nanocrystalline soft material- Permanent magnet material- Theoretical background- Super paramagnetism- Coulomb blockade-Quantum cellular Automata.

UNIT V: Application of Nanotechnology

Chemistry and Environment – Energy applications of nanotechnology- Information and Communication- Heavy industry-Consumer goods- Nanomedicine - Medical application of Nanotechnology

COURSE OUTCOMES:

On the completion of the course the students will

- have a basic knowledge about the science behind the behaviour of nanomaterials.
- be able to identify the structure of different nanomaterials.

- be able to apply the suitable technique for synthesis of nanomaterials.
- be able to develop a perspective for designing for new nanomaterials for novel applications.

Text Book:

1) Text book of Nanoscience and Nanotechnology – B. S. Moorthy, P. Sankar, Baldev Raj, B. B. Rath and James Murdy University Press – IIM
2) Nanophysics, Sr. GeradinJayam, Holy Cross College, Nagercoil (2010)

Reference:

1) 'Nanoscience and Nanotechnology: Fundamentals to Frontiers' M.S. Ramachandra Rao, Shubra Singh, Wiley India pvt. Ltd., New Delhi. (2013).
2) 'Nano the Essentials' - T. Pradeep, Tata Mc.Graw Hill company Ltd (2007)
3) '*The Chemistry of Nano materials : Synthesis, Properties and Applications*', Volume 1
C. N. R. Rao, A. Mu¨ller, A. K. Cheetham, , Germany (2004).

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600 108.
B. Sc. – PHYSICS
ELECTIVE PAPER I: Optional Paper III – ENERGY PHYSICS
(For the students admitted from the year 2019 – 2020)

HOURS PER WEEK	**: 4**	**SEMESTER**	**: V**
CREDITS	**: 4**	**SUBJECT CODE**	**: 19EBC**

OBJECTIVES:

- to provide an understanding of the present energy crisis and various available energy sources.
- To make the students understand the need to use solar energy and their applications
- To introduce into the principles of photovoltaic cells and the advantage of using them
- To know the importance of biomass energy, biogas production and their applications
- To gain knowledge about the wind and tidal energy

UNIT I: Introduction to Energy Sources

World's reserve of Commercial energy sources and their availability-India's production and reserves-Conventional and non-conventional sources of energy, comparison – Coal- Oil and natural gas –applications - merits and demerits.

UNIT II: Solar Thermal Energy

Solar constant -Solar spectrum-Solar radiations outside earth's atmosphere –at the earth surface- on tilted surfaces -Solar Radiation geometry-Basic Principles of Liquid flat plate collector –Materials for flat plate collector -Construction and working- Solar distillation–Solar disinfection - Solar drying-Solar cooker(box type)-Solar water heating systems – Swimming pool heating.

UNIT III: Photovoltaic Systems

Introduction-Photovoltaic principle-Basic Silicon Solar cell- Power output and conversion efficiency-Limitation to photovoltaic efficiency-Basic photovoltaic system for power generation-Advantages and disadvantages-Types of solar cells-Application of solar photovoltaic systems - PV Powered fan – PV powered area lighting system – A Hybrid System.

UNIT IV: Biomass Energy

Introduction-Biomass classification- Biomass conversion technologies-Bio-gas generation-Factors affecting bio-digestion -Working of biogas plant- floating and fixed dome type plant -advantages and disadvantage of -Bio-gas from plant wastes-Methods for obtaining energy from biomass- Thermal gasification of biomass-Working of downdraft gasifier- Advantages and disadvantages of biological conversion of solar energy.

UNIT V:Wind Energy and Other Energy Sources

Wind Energy Conversion-Classification and description of wind machines, wind energy collectors-Energy storage-- Energy from Oceans and Chemical energy resources-Ocean thermal energy conversion-tidal power, advantages and limitations of tidal power generation-Energy and power from waves- wave energy conversion devices- Fuel cells- and application of fuel cells- batteries-advantages of battery for bulk energy storage- Hydrogen as alternative fuel for motor vehicles.

COURSE OUTCOME:

On completion of the course the students will

- Have clear idea about how to tackle the present day energy crisis
- Able to realise the importance of renewable energy
- Have the knowledge about the Biogas production and their usage
- Know the importance of solar energy, wind, tidal and other forms of renewable energy

Books for study

1. Kothari D.P., K.C. Singal and Rakesh Ranjan, Renewable energy sources and emerging Technologies, Prentice Hall of India, 2008.
2. Solar Energy-principles of thermal collection and storage-S.P.SUKHAME tata-McGraw-Hill publishing company ltd.

Books for References

1. Chetan Singh Solanki, Solar Photvoltaics Fundamentals, Technologies and Applications, 2ndEdition, PHI Learning Private Limited, 2011.
2. Rai G. D, Non conventional Energy sources, 4th Edition, Khanna Publishers,
2010.
3. Jeffrey M. Gordon, Solar Energy: The State of the Art, Earthscan, 2013.
4. Kalogirou S.A., Solar Energy Engineering: Processes and Systems , 2nd Edition, Academic Press, 2013.
5. Zobaa A.F.and Ramesh Bansal, Handbook of Renewable Energy Technology, World Scientific, 2011.

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
CORE PAPER IX – NUCLEAR PHYSICS & RELATIVITY
(For the students admitted from the year 2019– 20)

HOURS PER WEEK	**:6**	**SEMESTER**	**:VI**
CREDITS	**:5**	**SUBJECT CODE**	**:19CBJ**

Objectives:

- To acquire knowledge on decay of nuclei and their stability.
- To understand the background of various nuclear reactions and interaction with matter.
- To learn the concepts of relativity.

UNIT – I NUCLEAR DECAY

Natural radioactivity – Laws of radioactive transformations – Half life period and decay constant – Transient and secular equilibrium - age of earth – Characteristics of α and β ray spectra – Geiger Nuttall law – Gamow's theory of alpha decay – Neutrino theory of beta decay - alpha ray spectrometer and spectra – Beta ray spectrometer and spectra – Nuclear isomerism – Artificial radioactivity – Isotopes and uses. (PROBLEM FROM THIS UNIT)

UNIT – II RADIATION DETECTORS AND PARTICLE ACCELERATORS

Geiger – Muller counter – Wilson's cloud chamber – Bubble chamber – Photographic emulsion technique – Scintillation counter – Linear accelerator – Cyclotron – Synchrotron – Betatron – Proton synchrotron.

UNIT – III NUCLEAR REACTIONS

Nuclear fission – Chain reaction – Critical mass – Atom Bomb- Controlled chain reaction-Nuclear reactor- Nuclear fusion –Energy production in stars-Thermo nuclear reactions – Fusion reactor-Hydrogen bomb.

UNIT IV: COSMIC RAYS AND ELEMENTARY PARTICLES

Cosmic rays-introduction-discovery-latitude, altitude and azimuth effects-longitudinal effect-north –south effect-seasonal and diurnal changes-primary and secondary cosmic rays-nature of cosmic rays- cosmic ray showers-Van Allen belt- origin of cosmic radiation.

Elementary particles-introduction-particles and antiparticles-antimatter-the fundamental interaction-elementary particle quantum numbers-conservation laws and symmetry-the quark model of nucleons.

UNIT – V RELATIVITY

Frame of reference – Galilean transformations – Newtonian relativity - Michelson and Morley experiment – Relevance of ether frame – Lorentz – Fitzgerald contraction – Ether drag hypothesis – Postulates of special theory of relativity.- Relativity of simultaneity – Lorentz transformation equation and its consequences – Relativistic addition of velocities – Length contraction and time dilation. Relativistic momentum – Relativistic mass – Equivalence of mass and energy –General relativity – Principle of equivalence – Gravitational red shift – Fundamental ideas of general relativity.

Course Outcomes:

On completion of the course the students will

- Have understanding on the basics of nuclear physics that treats atomic nuclei as self-bound many-body quantum systems
- Possess knowledge about particle- antiparticle, decay processes and their outcomes.
- Understand basic interaction between fundamental particles.
- Be able to analyze relativistic variation of mas, length, etc.

BOOKS FOR STUDY

1. Modern physics - R. Murugeshan
2. Atomic and nuclear physics – Little field and Thorley.
3. Concepts of Modern Physics - A. Beiser
4. Nuclear physics - D.C. Thayal.

BOOKS FOR REFERENCE

1. Nuclear Physics – Irving Kaplan.
2. Nuclear Physics – J.B.Rajam
3. Atomic and Nuclear Physics – Seemat and Albright.

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
CORE PAPER X –SOLID STATE PHYSICS
(For the students admitted from the year 2019– 20)

HOURS PER WEEK	**:6**	**SEMESTER**	**:VI**
CREDITS	**:5**	**SUBJECT CODE**	**:19CBK**

Objective:

- To understand the different types of bonding in solids
- To understand the magnetic and dielectric properties of crystalline structures.
- To acquire knowledge on the basics of magnetic phenomena on materials and various types of magnetization.
- To know the properties of superconducting materials.

UNIT I: BONDING IN SOLIDS

Band theory of solids – classification of solids on the basis of band theory - Types of bonds in crystals - Ionic, covalent, Metallic, Vander waals and Hydrogen Bonding – Examples for each type – Polar and Non-polar compounds – Sigma, Pi and Delta bonds - Bond energy of sodium chloride molecule - Cohesive energy - cohesive energy of ionic solids - application to sodium chloride crystal.

UNIT – II CRYSTAL PHYSICS

Crystal physics – Classification of solids – Crystallographic terms – Crystal systems – Bravais Lattices – crystal structures – SC, BCC, FCC, HCP and Diamond cubic –Other cubic structures – Nacl, ZnS and CsCl- Miller Indices – Symmetry elements of crystalline solids – Crystal defects – Point, line, surface and volume defects.

UNIT – III X RAY

X-rays - X-ray spectrum – Mosley's Law-Crystal Structure determination by X-ray diffraction – Bragg's Law – Laue method, Bragg's diffractometer and powder crystal method – Compton scattering. (PROBLEM FROM THIS UNIT)

UNIT – IV METALS AND SEMICONDUCTORS

Free electron theory – electrical and thermal conductivities – Wiedemann – Franz law –concept of phonons – Debye's theory of specific heat of solids – Semiconductors - intrinsic and extrinsic semiconductors – Intrinsic carrier concentration - Fermi Surface and Fermi energy – Fermi level for conductors, Intrinsic and extrinsic semiconductors (No derivation).

UNIT – V MAGNETIC MATERIALS AND SUPER CONDUCTIVITY

Dia, para and ferro magnetic materials – Langevin's theory of para magnetism – Weiss theory of para and ferro magnetism – Domain theory of ferromagnetism – Hysteresis – Hard and soft magnetic materials – Super Conductors – Introduction - General Properties of Superconductors - effect of magnetic field -Meissner effect - effect of current - thermal properties - entropy - specific heat -energy gap - isotope effect - Type–I and Type–II Superconductors - applications.

Course Outcomes:

On completion of the course the students will

- Summarize how crystalline materials are studied using diffraction
- Able to discuss about the interatomic forces and bonds between solids
- Explain the behavior of solids with their magnetic properties.
- Analyze the importance of superconducting materials in engineering applications.

BOOKS FOR STUDY

1. Solid State Physics - K. Ilangovan
2. Materials Science - M. Arumugam
3. Solid State Physics - S.O.Pillai

BOOKS FOR REFERENCE

1. Materials Science - P.K. Palanisamy
2. Materials Science and Engineering - V.Ragavan
3. Solid State Physics - Kittel
4. Solid State Physics - A.J.Decker

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
ELECTIVE PAPER II-OPTION I-DIGITAL ELECTRONICS & MICROPROCESSOR
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:6**	**SEMESTER**	**:VI**
CREDITS	**:5**	**SUBJECT CODE**	**:19EBD**

Objective:

- To acquire knowledge on number systems, arithmetic building blocks, memories.
- To understand the fundamental concepts of logic gates, counters, registers, fiber optics etc.
- To develop skill to build and troubleshoot combinational digital circuits.
- To understand the basic concepts of microprocessor, and programming instructions.

UNIT – I DIGITAL FUNDAMENTALS

Number systems and conversions – BCD Code – Gray Code – 1's and 2's Complements – Binary addition, subtraction, multiplication and division – Basic logic gates: NOT, OR and AND gate – NAND, NOR and XOR gate – NAND and NOR as universal building blocks. (PROBLEM FROM THIS UNIT)

UNIT – II SIMPLIFICATION OF LOGIC CIRCUITS

Laws and theorems of Boolean algebra – Simplification of logic equations – 4 variable Karnaugh map – pair, quad, octet – sum of products and product of sums – applications.

UNIT -III SEQUENTIAL LOGIC

Half adder – Full adder – Half subtractor – Full subtractor – Flip flop – RS, clocked RS, D, JK, JK master slave flip – flop – Register – Shift register – up and down Counter – Ripple counter and BCD counter – multiplexer and demultiplexer

UNIT – IV ARCHITECTURE OF MICROPROCESSOR

Architecture of 8085 – Registers, flags, ALU, instruction register and Decoder, Address and data bus – Timing and Control unit - Pin out diagram – functions of different pins - Programmer's model of 8085-interrupts- Types and Priority.

UNIT – V PROGRAMMING TECHNIQUES

Instruction set of 8085- Data transfer, Arithmetic, Logic, Special, Branch instructions- Addressing Modes – Assembly language and Machine language – programming techniques: Simple operations such as addition, subtraction, multiplication, and division of 8-bit numbers, arranging 8-bit numbers in ascending and descending order.

Course Outcomes:

On completion of the course the students will be able to

- Understand the structure of various number system and basic logic gates.
- design and solve the Boolean Algebra simplification and Karnaugh Maps.
- construct sequential circuits and to design counters.
- be familiar with the basic concepts of microprocessor architecture and instruction sets.
- apply the programming instructions to perform simple operations using microprocessor.

BOOKS FOR STUDY

1. Digital Principles and Applications by Malvino Leach, Tata McGraw Hill, 4th Edition (1992)
2. Digital Fundamentals by Thomas L.Floyd, Universal Book Stall, New Delhi (1998)
3. Fundamental of Microprocessor 8085 by V.Vijayendran, S.Viswanathan Publishers, Chennai (2003)

BOOKS FOR REFERENCE

1. Electronic principles by Malvino
2. Hand Book of electronics by Gupta and Kumar
3. Electronics made simple by lacohowitz

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600 108.
B.Sc. – PHYSICS
ELECTIVE PAPER II: Option Paper II – INTEGRATED ELECTRONICS
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**: 4**	**SEMESTER**	**: VI**
CREDITS	**: 4**	**SUBJECT CODE**	**: 19EBE**

OBJECTIVES:

- To understand the fundamental concepts of logic gates, counters, registers, etc.
- To exhibit proficiency in the basic concepts of circuit analysis involving operational amplifier and conversion of analog and digital signals.

Unit I : Fundamental Digital Electronics

Number systems – binary – hexadecimal – Binary addition – subtraction (1's and 2's compliment method) – multiplication - division - BCD – Conversion – simplification of logic circuits - using (i) Boolean algebra, (ii) Karnaugh map – Demorgan's theorems -NAND and NOR as universal building blocks.

Unit II : Combinational Logic Circuits

Half adder, full adder, half subtractor and full subtractor – 4 bit adder/subtractor - decoder, encoder - multiplexer - demultiplexer.

Unit III : Sequential Logic Circuits

RS flip flop, D flip flop and JK flip flops - JK Master Slave flip flop – synchronous and ripple counters - BCD counter – Up/Down counters - shift registers - serial and parallel registers - ring and twisted ring counter.

Unit IV : OP-AMP Basic Applications

Characteristics parameters – differential gain – CMRR – Slew rate – bandwidth - applications – inverter, non-inverter, integrator, differentiator, summing, difference andaveraging amplifier - solving simultaneous equations - comparator - square wave generator -Wien's bridge oscillator - Schmitt trigger

Unit V : Timer, DAC/ADC

Timer 555 - Internal block diagram and working - astablemultivibrator–Schmitt trigger.D/A converter - binary weighted method - A/D converter – successive approximation method.

COURSE OUTCOME:

On completion of the course the students will be able to:

- Explain how primitives of Boolean algebra are used to describe processing of digital signals.
- Design and analyze of electronic circuits
- Analyze, design and implement combinational logic circuits

Books for Study

1. Digital Principles and Application by Malvino Leach, Tata McGraw Hill, 4th Edition(1992).

2. Digital Fundamentals by Thomas L. Floyd, Universal Book Stall, New Delhi(1998).

3. Introduction to Integrated Electronics by V.Vijayendran, S. Viswanathan (Printersand Publishers) Pvt. Ltd., Chennai(2005).

4. OP - AMPs and Linear Integrated Circuits by Ramakant A. Gayakwad, PrenticeHall of India(1994).

Books for Reference

1. Digital Electronics by Practice Using Integrated Circuits - R.P.Jain - Tata McGrawHill(1996).

2. Linear Integrated Circuits by D. Roy Choudhury and Shail Jain - New AgeInternational (P) Ltd.(2003).

3. Electronics - Analog and Digital by I.J. Nagrath - Prentice - Hall of India, NewDelhi(1999).

4. Integrated Electronics by J.Millman and C.Halkias, Tata McGraw Hill, New Delhi(2001)

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600 108.
B.Sc. – PHYSICS
ELECTIVE PAPER II: Option Paper III– COMPUTER PROGRAMMING IN C^{++}
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**: 4**	**SEMESTER**	**: VI**
CREDITS	**: 4**	**SUBJECT CODE**	**: 19EBF**

Course Objectives:
Objective of the course is to provide knowledge about the basics of Computer programming in C++ and to solve problems by writing programs.

UNITI: WHAT IS C^{++}

Introduction - tokens - keywords - identifiers and constants - declaration of variables - basic data types - user defined data types-derived data types - symbolic constants - operators in C^{++} -expressions and their type-hierarchy of arithmetic operators- scope resolution operator – declaring, initializing and modifying variables-special assignment operators - all control structures-structure of a simple C ++ program

UNITII: ARRAYS AND FUNCTIONS IN C^{++}

Introduction - one dimensional and two dimensional arrays-initialization of arrays-array of strings

Functions-introduction-function with no argument and no return values-function with no argument but return value - function with argument and no return values- function with argument and return values- call by reference-return by reference- function prototyping - inline functions - local, -global and static variables- -function overloading - virtual functions-main function-math library functions.

UNITIII: CLASSES AND OBJECTS

Introduction - specifying a class - defining member functions-C^{++} program with class - nesting of member functions - private member functions - objects as function arguments - arrays within a class-array of objects-static class members-friend functions-constructors - parameterized constructors-multiple constructors - constructors with default arguments - copy constructor.

UNITIV:OPERATOR OVERLOADING, INHERITANCE AND POINTERS

Introduction -defining operator overloading - overloading unary operators - binary operators

Inheritance - single inheritance - multiple inheritance - multilevel inheritance - hybrid inheritance - hierarchial inheritance-virtual base class-abstract class

Pointers- definition-declaration- arithmetic operations

UNITV:MANAGING CONSOLE I/O OPERATIONS

Introduction - C^{++} stream - C^{++} stream classes - unformatted I/O Operations -formatted console I/O operations - working with files - classes for file steam operations - opening and closing a file - file pointers and their manipulations.

COURSE OUTCOMES:

On completion of the course the students will

- Understand the lexical elements in 'c'- programming.
- Be aware of different types of operators and expressions in c language.
- Choose the loops and decision-making statements to solve the problem
- Implement different operations in arrays.
- Use function to solve the given problem
- Understand pointers, structures etc

BOOK FOR STUDY:

1. E. Balagurusamy, Programming in ANSI C, Sixth Edition, McGraw Hill Education(India)Private Limited, New Delhi.

BOOKS FOR REFERENCE:

1. Schaum's Outlines : Programming with C , Byron S. Gottfried, Tata McGraw Hill Pub. Co Ltd., New Delhi, 5/e, 2007
2. Yashvant Kanetkar, Programming with C,2nd edition, Tata McGraw Hill, New Delhi,1998.

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
ELECTIVE PAPER III-OPTION PAPER I - CONTEMPORARY PHYSICS
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:6**	**SEMESTER**	**:VI**
CREDITS	**:5**	**SUBJECT CODE**	**:19EBG**

OBJECTIVES

- To create the basic knowledge in nano materials.
- To identify the techniques suitable for synthesis of nano materials.
- To understand the basics about the biological systems in our body, their behavior, and the diagnostic devices.
- To make them be aware and understand radiation hazards and safety measures.

UNIT I: NANOMATERIALS

Basic ideas of nanophase materials - History of Nanotechnology- Nanostructures- synthesis of oxide nano particles- Synthesis of nano materials – Bottom-Up and Top-Down approaches - Synthesis of semiconductor nano particles- Synthesis of metallic nano particles.

UNIT II: CARBON NANOTUBES

Discovery of Nanotubes- Types of carbon Nanotubes- Electronic structure of Carbon Nanotubes- Synthesis of Carbon Nanotube.

Application of Nanotechnology

Chemistry and Environment – Energy applications of nanotechnology- Information and Communication- Medical application of Nanotechnology.

UNIT III: BIO-AMPLIFIERS

Origin of bio potentials – Bio electric signals – Bio electrodes — Transducers – Active and passive transducers— Electrodes used in ECG, EEG and EMG. Necessity for special types of amplifiers for biological signal amplifications- Mechanical and Non mechanical chopper amplifiers.

UNIT IV: BIOMEDICAL INSTRUMENTS

Principle of Electro Cardio Graph (ECG) – Block diagram of ECG recorder – Basics of Electro Encephalo Graph (EEG) – Block diagram of EEG recorder – Fundamentals of Computer Tomography (CT) – Block diagram of CT scanner - Principle of ultrasound.

UNIT V: RADIATION SAFETY

Basic idea of different units of radioactivity, KERMA, exposure, absorbed dose, equivalent dose, effective dose, collective equivalent dose, Annual Limit of Intake (ALI) - Biological effects of ionizing radiation, Operational limits and basics of radiation hazards - Evaluation and control: radiation protection standards, International

Commission on Radiological Protection (ICRP) principles. (PROBLEM FROM THIS UNIT)

Course Outcomes:

On completion of the course the students will be able to

- Understand the properties and method of producing nanomaterials.
- Explain the principle of Physics underlying the biomedical instruments.
- Be aware of the radiation hazards and the safety measures to be followed.

BOOKS FOR STUDY:

3) Text book of Nanoscience and Nanotechnology – B. S. Moorthy, P. Sankar, Baldev Raj, B. B. Rath and James Murdy University Press – IIM
4) Nanophysics, Sr. Geradin Jayam, Holy Cross College, Nagercoil (2010)
5) Medical Physics –John R. Cameron and James G.Skofronick, 1978, John Willy & Sons.
6) Bio medical instrumentation – E D II, Dr M. Arumugam, Anuradha Agencies 1997.
7) W.J.Meredith and J.B.Massey, "Fundamental Physics of Radiology". John Wright and Sons, UK, 1989.
8) A.Martin and S.A.Harbisor, An Introduction to Radiation Protection, John Willey &Sons, Inc. New York, 1981.

BOOKS FOR REFERENCE:

1) 'Nanoscience and Nanotechnology: Fundamentals to Frontiers' M.S. Ramachandra Rao, Shubra Singh, Wiley India pvt. Ltd., New Delhi. (2013).
2) 'Nano the Essentials' - T. Pradeep, Tata Mc.Graw Hill company Ltd (2007)
3) W.R. Hendee, "Medical Radiation Physics", Year Book – Medical Publishers Inc. London, 1981

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI 600108.
B.Sc. – PHYSICS
ELECTIVE PAPER III: Option PAPER II–MEDICAL PHYSICS
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:4**	**SEMESTER**	**:VI**
CREDITS	**:4**	**SUBJECT CODE**	**:19EBH**

Objective:

- To understand about the behaviour and functioning of biological systems in our body.
- To gain knowledge about the basic anatomical terminologies.
- To develop knowledge about the construction of functioning of various diagnostice devices.

UNIT I

Basic Anatomical Terminology- Standard anatomical position, Planes, Familiarity with terms like – Superior, Inferior, Anterior, Posterior, Medial, Lateral, Proximal, Distal. – Forces on and in the Body – Physics of the Skeleton – Heat and Cold in Medicine- Energy work and Power of the Body.

UNIT II

Pressure system of the body- Physics of Cardiovascular system- Electricity within the Body – Applications of Electricity and Magnetism in Medicine.Sound in medicine- Physics of the Ear and Hearing- Light in medicine- Physics of eyes and vision.

UNIT III

Transducers- performance of characteristics of transducer- static and dynamic active transducers – (a) magnetic induction type (b) piezoelectric type (c) photovoltaic type (d) thermoelectric type.Passive transducer- (a) resistive type – effect and sensitivity of the bridge (b) capacitive transducer (c) linear variable differential transducer (LVDT)**.**

UNIT IV

X-rays- Production of X-rays- X-ray spectra- continues spectra and characteristic spectra- Coolidge tube- Electro Cardio Graph (ECG) - Block diagram- ECG Leads- Unipolar and bipolar-ECG recording set up.

UNIT V

Electro Encephalo Graph (EEG) - origin- Block diagram- Electro Myogragh (EMG) – Block diagram- EMG recorder- Computer Tomography (CT) principle- Block diagram of CT scanner.

COURSE OUTCOMES:

On the completion of course the students will

- have a knowledge about the functioning of biological systems in our body.
- be able to identify the sensing and therapeutic applications of physics in medicine.
- have an understanding about the measurement techniques and their significance.
- be able to interpret the experimental data of various diagnostic instruments.

Text Books

1. Medical Physics –John R. Cameron and James G.Skofronick, 1978, John Willy & Sons.
2. Bio medical instrumentation – Edition II, Dr M. Arumugam, Anuradha Agencies 1997.

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600 108.
B. Sc. – PHYSICS
ELECTIVE PAPER III: Optional Paper III - OPTO ELECTRONICS
(For the students admitted from the year 2019 – 2020)

HOURS PER WEEK	**: 4**	**SEMESTER**	**: VI**
CREDITS	**: 4**	**SUBJECT CODE**	**: 19EBJ**

OBJECTIVES:

- To give an introduction of the basic principles of Optoelectronic devices
- To know about the materials used for making Optoelectronic devices
- To understand the principle and working of LASER
- To introduce into the field of Fibre optic communication
- To make them understand the applications of Fibre optic communication

Unit I

Introduction – PN junction as a Light Source (LED) – LED materials – Advantages – LCD - Characteristics and action of LCD – Advantages.

Unit II

Laser- Introduction– characteristics of Laser– Spontaneous and stimulated emission– Einstein coefficients- condition for population inversion– three level scheme– semi conductor.

Unit III

Photo detector- characteristics of photo detectors– PN junction photo detector– PIN photo diode- Avalanche photo diode- Photo transistor.

Unit IV

Introduction – principle of optical fibre – light transmission in a optical fibre – Acceptance angle – Numerical aperture.

Unit V

Fibre index profiles – Step index, graded fibre (transmission of signals) – Advantages of fibre optic communications, optical switching – Logic gates.

COURSE OUTCOME:

On completion of the course the students will

- Have an idea about Optoelectronic devices
- Have the knowledge about the materials used in making semiconductor devices
- To know about the LASER

- To understand the technical details involved in Fibre optic communication

Text Book:

1. Semiconductor physics and Optoelectronics – P. K. Palanisamy, SCITECH Publication, Chennai 2002.
2. Optical fibres and Fibre Optic Communication – Sabir Kumar Sarkar IV Revised Edition 2003.

Reference Books:

1. Opto Electronics – Wilson & Hawker, Prentice Hall of India 2004.

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
PRACTICALS PAPER I
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:3**	**SEMESTER**	**:I & II**
CREDITS	**:5**	**SUBJECT CODE**	**:19CB1**

Any 15 Experiments

1. Compound pendulum-determination of
   (i) Radius of gyration
   (ii) Acceleration due to gravity "g"
2. Young's modulus by Non-uniform bending – Pin and Microscope
3. Young's modulus by Non-uniform bending -optic lever
4. Torsion pendulum – Rigidity modulus
5. Torsion pendulum with masses – moment of inertia and rigidity modulus.
6. Surface tension by Drop weight method
7. Interfacial surface tension by Drop weight method
8. Co-efficient of viscosity by Poiseuille's method
9. Specific heat capacity of solid by the method of mixtures (radiation correction)
10. Sonometer – determination of frequency
11. Sonometer – determination of specific gravity of solid and liquid.
12. Determination of focal length and refractive index of a convex lens
13. Determination of focal length of a concave lens.
14. Spectrometer – refractive index of the material of solid prism.
15. P.O.Box – Resistance and specific resistance of a wire.
16. Specific heat capacity of a liquid – Joule's calorimeter.
17. Characteristics of PN junction diode and Zener diode.
18. Basic logic gates using diodes.
19. Basic logic gates using transistors.
20. Potentiometer -Calibration of low range voltmeter.

COURSE OUTCOME:

On completion of the course the students will

- Understand the usage of basic laws and theories to determine various properties of the materials given.
- Understand the application side of the experiments.
- Use standard methods to calibrate the given low range voltmeter.
- Use the basic laws to study the spectral properties and optical properties of the given prism.

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
PRACTICALS PAPER II
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:3**	**SEMESTER**	**: III & IV**
CREDITS	**:5**	**SUBJECT CODE**	**:19CB2**

Any 15 Experiments

1. Young's modulus by uniform bending-Pin and microscope
2. Young's modulus by uniform bending by optic lever
3. Rigidity modulus by static torsion
4. Young's modulus by cantilever (scale and telescope)
5. Surface tension – capillary rise method.
6. Specific heat capacity by the method of cooling.
7. Lee's Disc – Thermal conductivity of a bad conductor and emissivity.
8. Melde's string – frequency determination
9. Melde's string – Specific gravity of solid and liquid
10. Spectrometer - Hollow Prism.
11. Spectrometer – i-d curve
12. Air wedge – diameter of a thin wire
13. Potentiometer -Calibration of ammeter
14. Potentiometer – Specific resistance of a wire
15. Determination of M and B_H using deflection and vibration magnetometer.
16. P.O. Box - temperature coefficient of resistance.
17. Field along the Axis of a coil using deflection magnetometer
18. Carey Foster's Bridge – measurement of resistance
19. Figure of Merit of a Mirror Galvanometer.
20. Construction of AND, OR and NOT gates using NAND gate. (Universal building block)

COURSE OUTCOME:

On the successful completion of the course, students will be able to

- Understand the usage of basic laws and theories to determine various properties of the materials given
- Use standard methods to calibrate the given high range voltmeter and ammeter.
- Measure resistance of the given coil and various physical quantities.
- Use of basic laws to study the spectral properties and optical properties of the given liquid prism.

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
PRACTICALS PAPER III
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:3**	**SEMESTER**	**: V&VI**
CREDITS	**:5**	**SUBJECT CODE**	**:19CB3**

Any 20 Experiments

1. Young's modulus by Koenig's method
2. Newton's rings – R_1,R_2 and **Error! Reference source not found.** of a Convex lens
3. Spectrometer – i-i^{l}curve.
4. Spectrometer – Dispersive power of a prism
5. Spectrometer – Narrow angled prism
6. Spectrometer – Grating – Normal incidence – Wavelength of mercury spectrum and dispersive power of grating
7. Spectrometer – Grating - Minimum deviation -Wavelength of mercury spectrum.
8. Carey foster's bridge – Temperature co-efficient of resistance.
9. Potentiometer – Calibration of high range voltmeter
10. Field along the axis of Coil – B_H using vibration magnetometer.
11. Deflection magnetometer. Tan C position – Determination of M and B_H (using vibration magnetometer)
12. E.M.F of thermocouple using potentiometer
13. E.M.F of thermocouple using mirror galvanometer.
14. Figure of merit of BG
15. Comparison of emf of cells using BG
16. Comparison of capacitance s using BG
17. Absolute capacitance of a condenser using BG (apply correction for damping)
18. Comparison of mutual inductance using BG
19. Absolute measurement of mutual inductance using BG
20. High resistance by leakage
21. Transistor characteristics (CE mode)
22. Transistor characteristics (CB mode)
23. Bridge rectifier – Zener diode- regulated power supply-regulation characteristics
24. Bifilar pendulum – Determination of M.I. of a rectangular block about three mutually perpendicular directions.
25. Conversion of a galvanometer into an ammeter and is calibration.
26. Conversion of a galvanometer into a voltmeter and its calibration.

COURSE OUTCOME:

On the successful completion of the course, students will be able to

- Measure the thermo EMF using potentiometer and Ballistic Galvanometer,
- Calibrate a Ballistic Galvanometer and understand the applications of the BG.
- Measure the components of Earth's magnetic field and the magnetic field produced by a current carrying conductor.
- Use of basic laws to study the spectral properties and optical properties of the given prism and grating.

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
PRACTICALS PAPER IV
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:3**	**SEMESTER**	**: V&VI**
CREDITS	**:5**	**SUBJECT CODE**	**:19CB4**

Any 15 Experiments

1. Single stage transistor amplifier-frequency response
2. Two stage RC coupled amplifier – Study of its gain.
3. Voltage regulation using IC 7805.
4. Hartley oscillator using transistor. (Frequency using CRO)
5. Colpitt's Oscillator using transistor. (Frequency using CRO)
6. Phase shift Oscillator using OPAMP.
7. Wien's bridge oscillator using OPAMP.
8. Wave shaping -clipping and clamping circuits using resistors and capacitors.
9. Differentiator and Integrator using resistors and capacitors.
10. Transistor Astable multivibrator
11. Basic logic gates using NOR (Universal building block)
12. Verification by Demorgan's theorem
13. Operational amplifier- Inverting amplifier, adder, voltage follower
14. Operational amplifier- Differentiator and integrator
15. Half adder and full adder
16. 4 Bit Ripple counter using 7473
17. 4 Bit shift register using 7473
18. Decade counter using 7490
19. 8085-8 bit Addition and subtraction
20. 8085 – 8 bit multiplication and division
21. 8085 – Ascending order
22. 8085 – Descending order

COURSE OUTCOME:

On the successful completion of the course, students will be able to

- Apply the theory to design the basic electronic circuits.
- Use these basic circuits to create amplifier circuits, oscillator, multivibrator, regulated power supplies etc.,
- Study the characteristics of amplifiers and oscillators.

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
ALLIED PHYSICS-I FOR B.Sc. MATHEMATICS
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:3**	**SEMESTER**	**:I**
CREDITS	**:3**	**SUBJECT CODE**	**:19ABA**

Objective:

- To understand the properties of liquids such as viscosity and surface tension
- To know heat transformation from one place to another, converting heat to do mechanical work
- To learn the basic properties of light such as interference and diffraction.

UNIT I: PROPERTIES OF MATTER

Young's modulus – Rigidity modulus – Bulk modulus – Poisson's ratio (definition alone) – Bending of beams – Expression for bending moment – determination of young's modulus by uniform and non-uniform bending. Torsional oscillations of a body– Rigidity modulus of a wire by torsion pendulum – Rigidity modulus by static torsion.

UNIT II: VISCOSITY AND SURFACE TENSION

Viscosity – Viscous force – Co-efficient of viscosity – units and dimensions – Poiseuille's formula for co-efficient of viscosity of a liquid – determination of co-efficient of viscosity using burette- Surface tension – Explanation of surface tension based on kinetic theory – Surface and interfacial surface tension by drop weight method.

UNIT III: CONDUCTION, CONVECTION AND RADIATION

Specific heat capacity of solids and liquids –Newton's law of cooling – Specific heat capacity of a liquid by cooling – thermal conduction –coefficient of thermal conductivity by Lee's disc method.

Convection process –Greenhouse effect – Black body radiation – Planck's radiation law – Rayleigh Jean's law, Wien's displacement law – Stefan's law of radiation. (No derivations).

UNIT IV: THERMODYNAMICS

Zeroth and I Law of thermodynamics – II law of thermodynamics – Carnot's engine and Carnot's cycle – Efficiency of a Carnot's engine – Entropy – Change in entropy in reversible and irreversible process – change in entropy of a perfect gas – change in entropy when ice is converted into steam.

UNIT V: OPTICS

Interference – conditions for interference maxima and minima – Air wedge – thickness of a thin wire – Newton's rings – determination of wavelength using Newton's rings.

Diffraction – Difference between diffraction and interference – Theory of transmission grating – normal incidence – optical activity –Specific rotatory power.

Course outcome:

On completion of the course the students will be able to

- Understand the various moduli of the materials and behavior of liquids due to surface tension.
- Explain transmission of heat due to process of conduction, convection and radiation and various laws involved in heat transformation.
- Observe and analyze the phenomenon like interference and diffraction

BOOKS FOR STUDY

1. Properties of matter – Brijlal and Subramanyam – Eurasia Publishing co., New Delhi, III Edition 1983
2. Element of properties of matter – D.S.Mathur – S.Chand & Company Ltd, New Delhi, 10th Edition 1976
3. Heat and Thermodynamics–Brijlal& Subramanyam, S.Chand & Co, 16th Edition 2005
4. Heat and Thermodynamics – D.S. Mathur, SultanChand & Sons, 5th Edition 2014.
5. Optics and Spectroscopy –R.Murugeshan, S.Chand and co., New Delhi, 6th Edition 2008.
6. A text book of Optics – Subramanyam and Brijlal, S. Chand and co.. New Delhi, 22nd Edition 2004.
7. Optics – Sathyaprakash, Ratan Prakashan Mandhir, New Delhi, VIIth Edition 1990.

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
ALLIED PHYSICS-II FOR B.Sc. MATHEMATICS
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:3**	**SEMESTER**	**:II**
CREDITS	**:3**	**SUBJECT CODE**	**:19ABB**

Objective:

- To understand the concept of resistance, capacitance and magnetic effect of current.
- To learn the atom models.
- To get familiarized with semiconductor diodes, transistor and basic logic gates.

UNIT I: CURRENT ELECTRICITY

Ohm's law – Law of resistance in series and parallel – Specific resistance – capacitors – capacitors in serial and parallel – Wheatstone's network – condition for balance.

Carey-Foster's bridge – measurement of resistance – measurement of specific resistance –determination of temperature coefficient of resistance – Potentiometer – Design and working principle.

UNIT II: ELECTROMAGNETISM

Electromagnetic Induction – Faraday's laws – Lenz law – Self Inductance – Mutual Inductance – Coefficient of Coupling

A.C. Circuits – Mean value – RMS value – Peak value – LCR in series circuit – impedance – resonant frequency – sharpness of resonance.

UNIT III: ATOMIC AND NUCLEAR PHYSICS

Bohr's atom model – radius and energy – Atomic excitation – Ionization potential – Frank and Hertz Method – Nucleus – Nuclear properties – Mass defect – Binding energy.

Radio isotopes – Uses of radio isotopes – Nuclear fusion and nuclear fission – Nuclear reactor - X-rays – Production – properties –Derivation of Bragg's law – uses in industrial and medical fields.

UNIT IV: ANALOG ELECTRONICS

Semiconductor – PN junction diode – V-I characteristics - Bridge rectifier – Zener diode – equivalent circuit – voltage regulator.

Transistor – Working of a transistor - CE transistor Characteristics.

UNIT V: DIGITAL ELECTRONICS

Number system – Decimal – Binary – conversion of one number system to another number system.

Logic gates – OR, AND, NOT, NAND and NOR gates – truth tables – NAND and NOR as Universal Building blocks - De Morgan's theorems – Verification.

COURSE OUTCOMES:

On completion of the course the students will be able to

- Understand the concept of resistance, capacitance and magnetic effect of current.
- Visualize the atom models.
- Make circuits using semiconductor diodes, transistor.

BOOKS FOR STUDY

1. Electricity and Magnetism – R. Murugesan, S. chand & co, 2001.
2. Modern Physics – R. Murugesan, S. chand & co, 1998.

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
ALLIED PHYSICS PRACTICALS FOR B.Sc. MATHEMATICS
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:3**	**SEMESTER**	**:I & II**
CREDITS	**:4**	**SUBJECT CODE**	**:19AB1**

Any 15 Experiments

1. Young's modulus by non-uniform bending-Pin and microscope method
2. Young's modulus by non-uniform bending-Scale and Telescope method
3. Rigidity modulus by static torsion
4. Rigidity modulus by torsion pendulum (without masses)
5. Surface tension by drop weight method
6. Interfacial surface tension between two liquids by drop weight method
7. Sonometer-Frequency of AC mains
8. Specific heat of a solid by the method of mixtures
9. Spectrometer-Grating-wavelength determination (N given)
10. Air wedge – thickness of thin wire
11. Potentiometer- Calibration of low range voltmeter
12. Potentiometer-Calibration of ammeter
13. Field along the axis of a coil-Deflection magnetometer.
14. Figure of merit of table galvanometer
15. Logic gates using diodes.
16. Logic gates using transistors.
17. NAND – Universal building block
18. NOR – Universal building block
19. PN junction Diode Characteristics
20. Zener Diode Characteristics

COURSE OUTCOMES:

On completion of the course the students will be able to

- Enhance the theoretical understanding of the concepts that they learn during the lecture hours.
- Have a deep knowledge of fundamentals of optics, electric circuits, magnetism and sound.

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
ALLIED PHYSICS-I FOR B.Sc. CHEMISTRY
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:3**	**SEMESTER**	**:III**
CREDITS	**:3**	**SUBJECT CODE**	**:19ABC**

Objective:

- To understand the properties of liquids such as viscosity and surface tension
- To know heat transformation from one place to another, converting heat to do mechanical work
- To learn the basic properties of light such as interference and diffraction.

UNIT I: PROPERTIES OF MATTER

Young's modulus – Rigidity modulus – Bulk modulus – Poisson's ratio (definition alone) – Bending of beams – Expression for bending moment – determination of young's modulus by uniform and non-uniform bending. Torsional oscillations of a body– Rigidity modulus of a wire and M.I. of a disc by torsion pendulum – Rigidity modulus by static torsion.

UNIT II: VISCOSITY AND SURFACE TENSION

Viscosity – Viscous force – Co-efficient of viscosity – units and dimensions – Poiseuille's formula for co-efficient of viscosity of a liquid – determination of co-efficient of viscosity using burette- Surface tension – Explanation of surface tension based on kinetic theory – Surface and interfacial surface tension by drop weight method.

UNIT III: CONDUCTION, CONVECTION AND RADIATION

Specific heat capacity of solids and liquids – Dulong and Petit's law – Newton's law of cooling – Specific heat capacity of a liquid by cooling – thermal conduction – coefficient of thermal conductivity by Lee's disc method.

Convection process –Greenhouse effect – Black body radiation – Planck's radiation law – Rayleigh Jean's law, Wien's displacement law – Stefan's law of radiation. (No derivations).

UNIT IV: THERMODYNAMICS

Zeroth and I Law of thermodynamics – II law of thermodynamics – Carnot's engine and Carnot's cycle – Efficiency of a Carnot's engine – Entropy – Change in entropy in reversible and irreversible process – change in entropy of a perfect gas – change in entropy when ice is converted into steam.

UNIT V: OPTICS

Interference – conditions for interference maxima and minima – Air wedge – thickness of a thin wire – Newton's rings – determination of wavelength using Newton's rings.

Diffraction – Difference between diffraction and interference – Theory of transmission grating – normal incidence – optical activity –Specific rotatory power.

Course Outcomes:

On completion of the course the students will be able to

- Understand the various moduli of the materials and behavior of liquids due to surface tension.
- Explain transmission of heat due to process of conduction, convection and radiation and various laws involved in heat transformation.
- Observe and analyze the phenomenon like interference and diffraction.

BOOKS FOR STUDY

1. Properties of matter – Brijlal and Subramanyam – Eurasia Publishing co., New Delhi, III Edition 1983
2. Element of properties of matter – D.S.Mathur – S.Chand & Company Ltd, New Delhi, 10th Edition 1976
3. Heat and Thermodynamics–Brijlal& Subramanyam, S.Chand & Co, 16th Edition 2005
4. Heat and Thermodynamics – D.S. Mathur, SultanChand & Sons, 5th Edition 2014.
5. Optics and Spectroscopy –R.Murugeshan, S.Chand and co., New Delhi, 6th Edition 2008.
6. A text book of Optics – Subramanyam and Brijlal, S. Chand and co.. New Delhi, 22nd Edition 2004.
7. Optics – Sathyaprakash, Ratan Prakashan Mandhir, New Delhi, VIIth Edition 1990.

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
ALLIED PHYSICS-II FOR B.Sc. CHEMISTRY
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:3**	**SEMESTER**	**:IV**
CREDITS	**:3**	**SUBJECT CODE**	**:19ABD**

Objective:

- To understand the concept of resistance, capacitance and magnetic effect of current.
- To learn the atom models.
- To get familiarized with semiconductor diodes, transistor and basic logic gates.

UNIT I: CURRENT ELECTRICITY

Ohm's law – Law of resistance in series and parallel – Specific resistance – capacitors – capacitors in serial and parallel – Kirchoff's laws – Wheatstone's network – condition for balance.

Carey-Foster's bridge – measurement of resistance – measurement of specific resistance –determination of temperature coefficient of resistance – Potentiometer – Design and working principle.

UNIT II: ELECTROMAGNETISM

Electromagnetic Induction – Faraday's laws – Lenz law – Self Inductance – Mutual Inductance – Coefficient of Coupling

A.C. Circuits – Mean value – RMS value – Peak value – LCR in series circuit – impedance – resonant frequency – sharpness of resonance.

UNIT III: ATOMIC AND NUCLEAR PHYSICS

Bohr's atom model – radius and energy – Atomic excitation – Ionization potential – Frank and Hertz Method – Nucleus – Nuclear properties – Mass defect – Binding energy.

Radio isotopes – Uses of radio isotopes – Nuclear fusion and nuclear fission – Nuclear reactor - X-rays – Production – properties –Derivation of Bragg's law – uses in industrial and medical fields.

UNIT IV: ANALOG ELECTRONICS

Semiconductor – PN junction diode – V-I characteristics - Bridge rectifier – Zener diode – equivalent circuit – voltage regulator.

Transistor – Working of a transistor - CE transistor Characteristics.

UNIT V: DIGITAL ELECTRONICS

Number system – Decimal – Binary – conversion of one number system to another number system.

Logic gates – OR, AND, NOT, NAND and NOR gates – truth tables – NAND and NOR as Universal Building blocks - De Morgan's theorems – Verification.

Course Outcomes:

On completion of the course the students will be able to

- Understand the concept of resistance, capacitance and magnetic effect of current.
- Visualize the atom models.
- Make circuits using semiconductor diodes, transistor.

BOOKS FOR STUDY

1. Electricity and Magnetism – R. Murugesan, S. chand & co, 2001.
2. Modern Physics – R. Murugesan, S. chand & co, 1998.
3. Basic Electronics – B.L. Theraja, S. chand & co, 2003.

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc. – PHYSICS
ALLIED PHYSICS PRACTICALS FOR B.Sc. CHEMISTRY
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:3**	**SEMESTER**	**:III & IV**
CREDITS	**:4**	**SUBJECT CODE**	**:19AB2**

Any 15 Experiments

1. Young's modulus by non-uniform bending-Pin and microscope method
2. Young's modulus by non-uniform bending-Scale and Telescope method
3. Rigidity modulus by static torsion
4. Rigidity modulus by torsion pendulum (without masses)
5. Surface tension by drop weight method
6. Interfacial surface tension between two liquids by drop weight method
7. Sonometer-Frequency of AC mains
8. Specific heat of a solid by the method of mixtures
9. Spectrometer-Grating-wavelength determination (N given)
10. Air wedge – thickness of thin wire
11. Potentiometer- Calibration of low range voltmeter
12. Potentiometer-Calibration of ammeter
13. Field along the axis of a coil-Deflection magnetometer.
14. Figure of merit of table galvanometer
15. Logic gates using diodes.
16. Logic gates using transistors.
17. NAND – Universal building block
18. NOR – Universal building block
19. PN junction Diode Characteristics
20. Zener Diode Characteristics

COURSE OUTCOME:

On completion of the course the students will be able to

- Enhance the theoretical understanding of the concepts that they learn during the lecture hours.
- Have a deep knowledge of fundamentals of optics, electric circuits, magnetism and sound.

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
DEPARTMENT OF PHYSICS
NON MAJOR ELECTIVE I – FUNDAMENTAL PHYSICS I
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:2**	**SEMESTER**	**:III**
CREDITS	**:2**	**SUBJECT CODE**	**:19NB1**

OBJECTIVES

- To impart knowledge on basic laws of Physics to Non-Physics students.

UNIT – I MECHANICS

International system of Units – Scalar and Vector – Motion along a straight line- Displacement velocity and Acceleration – Newton's Laws of Motion – Force F=ma - work, Power & Energy.

UNIT – II PROPERTIES OF MATTER

Gravitation – Kepler's law of planetary Motion – Newton's Law of Gravitation- Satellites – Escape velocity, Orbital velocity – Static Equilibrium – Centre of gravity of a rigid body – Definition-.

UNIT – III SOUND

Wave motion – Longitudinal waves and Transverse Waves – $V = n\lambda$ - Music and Noise – Ultrasonic waves Definition and applications.

UNIT – IV HEAT

International Temperature scale – Celsius, Fahrenheit & Kelvin Scale – Conversion – Fixed points – States of matter - solid, liquid and Gas - Change of state – Melting point and Boiling point – Transfer of heat – Definition of conduction, convection and radiation.

Course Outcomes:

On completion of the course the students will be able to

- Understand the fundamental laws of Physics

BOOKS FOR STUDY

1. Fundamentals of Physics – Haliday & Resnick
2. Heat & thermodynamics – Brijlal & Subramaniam
3. Text Book of Sound – Brijlal & Subramanian
4. Allied Physics – R. Murugesan

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
DEPARTMENT OF PHYSICS
NON MAJOR ELECTIVE II – FUNDAMENTAL PHYSICS II
(For the students admitted from the year 2019 – 20)

HOURS PER WEEK	**:2**	**SEMESTER**	**:IV**
CREDITS	**:2**	**SUBJECT CODE**	**:19NB2**

OBJECTIVES

- To impart knowledge on basic laws of Physics to Non-Physics students.

UNIT – I ELECTRICITY AND MAGNETISM

Electric charge- Conductors and Insulators- Coulomb's law- Electric field – Capacitors and its uses – Voltage, Resistance - Ohm's Law(V=IR) - Series and Parallel connection of resistors- Magnetic field (Definition)– Elements of Earth's magnetic field (Definitions).

UNIT – II OPTICS

Reflection, Refraction and its Laws-Total internal reflection – Spherical Lenses – Power of Lens – Laser Principle and its applications.

UNIT – III ATOMIC PHYSICS AND NUCLEAR PHYSICS

Structure of an Atom – Bohr atom model (No derivation) – Basic Properties of Nuclei – Mass, Radius, and Binding Energy - Radioactivity – Properties of alpha, beta and gamma rays.

UNIT – IV ELECTRONICS

Introduction – Intrinsic Semiconductors- Extrinsic Semiconductor – P type and N type materials – Doping and degree of doping - Junction diodes-Structure, working and Symbol - Junction Transistors – Structure and Symbol –AND, OR & NOT logic gates – Truth table only.

Course Outcomes:

On completion of the course the students will be able to

- Understand the fundamental laws of Physics

BOOKS FOR STUDY:

1. Fundamentals of Physics – Halliday and Resnick
2. Allied Physics – R. Murugesan

பாரதி மகளிர் கல்லூரி (தன்னாட்சி) சென்னை – 108

இளங்கலை/இளமறிவியல்/இளம்வணிகவியல்

முதற்பருவம் பகுதி - 1 தமிழ் - தாள் - 1

(செய்யுள், இலக்கணம், மொழித்திறன், பொதுக்கட்டுரை, இலக்கியவரலாறு)

(2019-2020 இலும் பின்னரும் சேரும் மாணவியருக்கு உரியது)

HOURS PER WEEK : 6

SEMESTER : 1

CREDIT : 3

CODE:19LAA

நோக்கம்

இருபதாம் நூற்றாண்டுக் கவிஞர்களின் புலமையையும், சமுதாயச் சிந்தனையையும் உணரச் செய்தல். தமிழில் பிழையற எழுதப் பயிற்சி அளித்தல்.

அலகு – 1
1. பாரத நாடு - பாரதியார்
2. தமிழின் இனிமை - பாரதிதாசன்
3. மாணவனுக்கு - நாமக்கல் கவிஞர்
4. ஆறோடும் மண்ணில் - கண்ணதாசன்

அலகு – 2
5. மழை - வாணிதாசன்
6. வாக்குச் சீட்டுகளுக்கு ஓர் அர்த்தம் வரட்டும் - ஈரோடு தமிழன்பன்
7. ஒரு மாறுதலுக்காக - வைரமுத்து
8. மரங்கள் - மு.மேத்தா

அலகு – 3
9. கதவு - மகுடேஸ்வரன்
10. தொலைந்து போனேன் - தாமரை
11. அம்மா - இளம்பிறை
12. பயணத்துக்குத் தயாராகுதல் - யூமா வாசுகி

அலகு – 4
(அ) மொழித்திறன் (பிழைதிருத்தம், நேர்காணல்)
(ஆ) பொதுக்கட்டுரை

அலகு – 5
தமிழ் இலக்கிய வரலாறு
(அ) இருபதாம் நூற்றாண்டுக் கவிஞர்கள்
(ஆ) புதுக்கவிதை தோற்றமும் வளர்ச்சியும்

குறிப்பு : இலக்கணம்: பாரதிதாசனிய இலக்கணக்குறிப்பு

*(பகுதி அ&ஆ வினாக்கள், 1,2,3 அலகுகளில் இருந்து கேட்கப்படவேண்டும்)

*(பகுதி இ வினாக்கள் 4,5 அலகுகளில் இருந்து கேட்கப்படவேண்டும்)

பயன்கள்

இருபதாம் நூற்றாண்டுக் கவிஞர்களின் புலமையையும், சமுதாயச் சிந்தனையையும், மாணவியர் உணர்தல். தமிழில் பிழையற எழுதி மாணவியர் பயன்பெறல்.

பாரதி மகளிர் கல்லூரி (தன்னாட்சி) சென்னை – 108

இளங்கலை/இளமறிவியல்/இளம்வணிகவியல்

இரண்டாம் பருவம் பகுதி - 1 தமிழ் - தாள் - 2

(செய்யுள், உரைநடை, மொழித்திறன், இலக்கணம், இலக்கியவரலாறு)

(2019-2020 இலும் பின்னரும் சேரும் மாணவியருக்கு உரியது)

HOURS PER WEEK : 6

CREDIT : 3

SEMESTER : 2

CODE : 19LAB

நோக்கம்

பக்தி இலக்கியங்கள் மற்றும் சிற்றிலக்கியங்கள் குறித்த அறிமுகத்தைப் பெறச் செய்தல். கலைச்சொல்லாக்க முறைமையை அறிமுகம் செய்தல், மொழித்திறனை மேம்படுத்தல்.

அலகு – 1 சிற்றிலக்கியம்

1. குறவஞ்சி (குற்றாலக் குறவஞ்சி – நகர்வளம்) 5பாடல்கள்
2. தூது (தமிழ்விடுதூது - தமிழின் தெய்வீக ஆற்றல்) (124-133) 10பாடல்கள்
3. சதகம் (தண்டலையார் சதகம் - பொய்யின் தீமை, பெரியோரை இகழ்தல், குலத்தைக் கெடுப்போர், ஒழுக்கங் கெடுதல், துறவறச் சிறப்பு)

அலகு – 2

1. தேவாரம்

(திருநாவுக்கரசர் - நமச்சிவாயத் திருப்பதிகம், பாடல்- 1-10)

2. நாலாயிரத் திவ்வியப் பிரபந்தம்

(ஆண்டாள் திருப்பாவை 1-7,10,12,13) 10 பாடல்கள்

3.திருவருட்பா – பிள்ளைச் சிறு விண்ணப்பம் (5 பாடல்கள்)

அலகு – 3

1. பராபரக்கண்ணி (1-20 கண்ணிகள்) குணங்குடி மஸ்தான் சாகிபு
2. இயேசு காவியம் (மலைப்பொழிவு) கவிஞர் கண்ணதாசன்

அலகு – 4

(அ) கலைச்சொல்லாக்கம், விளம்பரம் எழுதுதல்

(ஆ) உரைநடை

காப்பிய மகளிர் - முனைவர்.சரளா இராசகோபாலன்

1. சுரமஞ்சரி - சீவக சிந்தாமணி - திருத்தக்கதேவர்

2. நீலக்குயிலி - குயில்பாட்டு - பாரதியார்
3. கிள்ளை - காதலா?கடமையா - பாரதிதாசன்;

அலகு - 5 இலக்கிய வரலாறு

1.சிற்றிலக்கியம் – குறவஞ்சி, தூது, சதகம்

2. பக்தி இலக்கியம் – சைவம், வைணவம், இசுலாம், கிறித்துவம்

குறிப்பு: இலக்கணம்: பாடந்தழுவிய இலக்கணக்குறிப்பு

*(பகுதி அ&ஆ வினாக்கள், 1,2,3 அலகுகளில் இருந்து கேட்கப்படவேண்டும்)

*(பகுதி இ வினாக்கள் 4,5 அலகுகளில் இருந்து கேட்கப்படவேண்டும்)

பயன்கள்

பக்தி இலக்கியங்கள் மற்றும் சிற்றிலக்கியங்கள் குறித்த அறிமுகத்தை மாணவியர் பெறுவர். கலைச்சொல்லாக்க முறைமையைக் குறித்த அறிமுகத்தையும் மொழித்திறனையும் மாணவியர் பெறுவர்.

பாரதி மகளிர் கல்லூரி (தன்னாட்சி) சென்னை – 108

இளங்கலை/இளமறிவியல்

மூன்றாம் பருவம் பகுதி 1 தமிழ் - தாள் - 3

(செய்யுள், இலக்கணம், சிறுகதை, கடிதம், இலக்கிய வரலாறு)

(2019-2020 இலும் பின்னரும் சேரும் மாணவியருக்கு உரியது)

HOURS PER WEEK : 6

CREDIT : 3

SEMESTER : 3

CODE : 19LAC

நோக்கம்

தமிழ்மொழியின் வளமான காப்பிய மரபை அறிமுகம் செய்தல் - நவீனச் சிறுகதைகளை அறிமுகப்படுத்துதல் - அலுவலகக் கடிதங்கள் எழுதப் பயிற்சி அளித்தல்.

அலகு – 1 சிலப்பதிகாரம் - மதுரைக்காண்டம் ஆய்ச்சியர் குரவை 1-38வரிகள்

மணிமேகலை – ஊரலர் உரைத்த காதை – 1-75வரிகள்

அலகு – 2 கம்பராமாயணம் - அயோத்தியா காண்டம் - நகர் நீங்கு படலம்

(1 – 20 பாடல்கள்)

சீவகசிந்தாமணி – பதிகம் - 20பாடல்கள் (7,910,11,12,13,14, 15,16,17,18,20,21,22,23,24,25,26,27,28)

அலகு – 3 பெரியபுராணம் - திருநின்றசருக்கம் -திருநீலநக்கநாயனார் புராணம் (முழுமை) 1 – 38 பாடல்கள்

அலகு - 4 சிறுகதை

1. கதவு - கி.ராஜநாராயணன்
2. மிஸ்டர் மார்ட்டின் - தோப்பில் முகம்மது மீரான்
3. பூவுக்குக் கீழே - கந்தர்வன்
4. ஆராய்ச்சி - ஆர்.சூடாமணி

அலகு – 5 (அ) கடிதம் வரைதல்

(ஆ) இலக்கிய வரலாறு

ஐம்பெருங்காப்பியங்கள், ஐஞ்சிறுகாப்பியங்கள்,

பிற்காலக்காப்பியங்கள்.

குறிப்பு: இலக்கணம்: பாடந்தழுவிய அணி இலக்கணக்~~குறிப்பு~~

*(பகுதி அ&ஆ வினாக்கள், 1,2,3 அலகுகளில் இருந்து கேட்கப்படவேண்டும்)

*(பகுதி இ வினாக்கள் 4,5 அலகுகளில் இருந்து கேட்கப்படவேண்டும்)

பயன்கள்

தமிழ்மொழியின் வளமான காப்பிய மரபு மற்றும் நவீனச் சிறுகதைகள் குறித்த அறிமுகத்தை மாணவியர் அறிவர். மொழியைக் கையாளும் திறன்பெறுவர்.

பாரதி மகளிர் கல்லூரி (தன்னாட்சி) சென்னை – 108
இளங்கலை/இளமறிவியல்
நான்காம் பருவம் பகுதி - 1 தமிழ் - தாள் - 4
(செய்யுள், இலக்கணம், நாடகம், மொழிபெயர்ப்பு, இலக்கியவரலாறு)
(2019-2020 இலும் பின்னரும் சேரும் மாணவியருக்கு உரியது)

HOURS PER WEEK : 6
CREDIT : 3
SEMESTER : 4
CODE : 19LAD

நோக்கம்

பண்டைய செவ்வியல் இலக்கியங்கள் மற்றும் அற இலக்கியங்களை அறிமுகப்படுத்துதல் - நாடகம் குறித்த அறிமுகத்தைத் தருதல் - மொழிபெயர்ப்புத் திறனை வளர்த்தல்.

அலகு – 1 நற்றிணை – 110 (போதனார்)

குறுந்தொகை – 40 (செம்புலப்பெயறீரார்)

அகநானூறு – 122 (பரணர்)

புறநானூறு – 82 (சாத்தந்தையார்)

பதிற்றுப்பத்து – 7ஆம் பத்து – பாடல் - 1 (கபிலர்)

அலகு – 2 முல்லைப்பாட்டு முழுவதும் (நப்பூதனார்)

அலகு – 3 திருக்குறள் - வான் சிறப்பு (அறம்)

நாலடியார் - 211

பழமொழி நானூறு – 82

திரிகடுகம் - 96

இன்னா நாற்பது – 10

அலகு – 4 (அ) அறிஞர் அண்ணாவின்

நீதிதேவன் மயக்கம் - நாடகம்.

(ஆ) மொழிபெயர்ப்பு (பத்தி/கடித மொழிபெயர்ப்பு)

அலகு – 5 இலக்கிய வரலாறு

எட்டுத்தொகை, பத்துப்பாட்டு, பதினெண்கீழ்க்கணக்கு

குறிப்பு: இலக்கணம்: பாடந்தழுவிய திணை, துறை விளக்கம்

*(பகுதி அ&ஆ வினாக்கள், 1,2,3 அலகுகளில் இருந்து கேட்கப்படவேண்டும்)

*(பகுதி இ வினாக்கள் 4,5 அலகுகளில் இருந்து கேட்கப்படவேண்டும்)

பயன்கள்

பண்டைய செவ்வியல் இலக்கியங்கள், அற இலக்கியங்கள் மற்றும் நாடகம் குறித்த அறிமுகத்தை மாணவியர் அறிந்துக்கொள்வர்.

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600 108.
B.A./B.Sc./B.Com.
GENERAL ENGLISH PAPER- I
(For the students admitted from the year 2019)

HOURS PER WEEK : 4 **SEMESTER : I**
CREDITS : 3 **SUBJECT CODE : 19GEA**

OBJECTIVES:

- To provide the students with an enjoyable literary experience through the genres like Prose, Poetry, Biography, Short Story And One Act Plays.
- To ensure an appreciable level of skill acquisition among students.

UNIT- I: POETRY

1) The Village School Master - Oliver Goldsmith
2) The House of My Childhood - Dilip Chitre

UNIT- II: PROSE

1) Dream Children: A Reverie - Charles Lamb
2) The Beauty Industry - Aldous Huxley

UNIT- III: SHORT STORY

1) The Blind Dog - R. K. Narayan

UNIT- IV: GRAMMAR

1) Tense - Identification of Tense
2) Articles - Fill in the Blanks
3) Parts of Speech - Identification

UNIT- V: COMPOSITION

1) Reading Comprehension (Textual)
2) Hints Development

BOOK FOR STUDY:

WOR (L) D VIEW – Mainspring Publication

BOOKS FOR REFERENCE:

- High School English Grammar And Composition - Wren & Martin
- A Junior English Grammar And Composition - N. K. Agarwal

LEARNING OUTCOME:

On completion of this course the students

- Familiarize themselves with basics of English through the literary texts from different genres
- Progress effectively in fundamental usage of Grammar
- Writing skills are tuned through Composition exercises

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600 108.
B.A./B.Sc./B.Com.
GENERAL ENGLISH PAPER II
(For the students admitted from the year 2019)

HOURS PER WEEK : 4 | **SEMESTER : II**
CREDITS : 3 | **SUBJECT CODE : 19GEB**

OBJECTIVES:

- To enable students to communicate effectively in English.
- To fine tune reading and writing skills with emphasis on basic grammar.

UNIT- I: POETRY

1) A Poison Tree - William Blake
2) The Professor - Nissim Ezekiel

UNIT- II: PROSE

1) I Won't Let Him Go - Madhavan Kutty
2) The Beautiful - Ruskin Bond

UNIT- III: BIOGRAPHY

1) Dr. Ambedkar

UNIT- IV: GRAMMAR

1) Tense - Writing Sentences
2) Article - Cloze Test
3) Parts of Speech - Fill in the blanks with the suitable parts of speech

UNIT- V: COMPOSITION

1) Reading Comprehension
2) Letter Writing - Requisition Letter for Transfer Certificate or Bonafide Certificate or Attendance Certificate

BOOK FOR STUDY:

WOR (L) D VIEW – Mainspring Publication

BOOKS FOR REFERENCE:

- High School English Grammar And Composition - Wren & Martin
- A Junior English Grammar And Composition - N. K. Agarwal

LEARNING OUTCOME:

On completion of this course the students

- Enter into next phase of learning English through interesting texts
- Gain more skills in the application of Grammar
- Enhance writing skills through composition

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600 108.
B.A./B.Sc./B.Com.
GENERAL ENGLISH PAPER III
(For the students admitted from the year 2019)

HOURS PER WEEK : 4 | **SEMESTER : III**
CREDITS : 3 | **SUBJECT CODE : 19GEC**

OBJECTIVES:

- To enhance language learning through literature
- To prepare the students for employability.

UNIT- I: POETRY

1) Red, Red, Red Rose - Robert Burns
2) Poor Girl - Maya Angelo
3) Clouds And Waves- Rabindranath Tagore

UNIT- II: PROSE

1) My Greatest Olympic Prize - Jesse Owens
2) A Simple Philosophy – Seathe
3) Toasted English – R K Narayan

UNIT- III: EXTENSIVE READER

1) Mother's Day - J. B. Priestley
2) Diamond Necklace - Guy De Maupassant

UNIT- IV: GRAMMAR

1) Voice- Identification
2) Question Tag (with options)
3) Degrees of Comparison- Identification

UNIT- V: COMPOSITION

1) Reading Comprehension
2) Letter Writing - Asking permission to attend competition / Permission to go home.

BOOK FOR STUDY:

WOR (L) D VIEW – Mainspring Publication

BOOKS FOR REFERENCE:

- High School English Grammar And Composition - Wren & Martin
- A Junior English Grammar And Composition - N. K. Agarwal

LEARNING OUTCOME:

On completion of this course the students

- Enrich themselves in basic English by absorbing the themes, Characters and Life narratives
- Move to a well-defined Grammar-learning phase
- Augment their writing skills through composition

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600 108.
B.A./B.Sc./B.Com.
GENERAL ENGLISH PAPER IV
(For the students admitted from the year 2019)

HOURS PER WEEK : 4
CREDITS : 3
SEMESTER : IV
SUBJECT CODE : 19GED

OBJECTIVES:

- To create an interest among students towards English language learning and making it a continuous process in life.
- To equip the students with the skills required for employability.

UNIT- I: POETRY

1) A Little Boy's Dream – Katherine Mansfield
2) This is Going to Hurt just a Little - Ogden Nash
3) All Is Life – Ruskin Bond

UNIT- II: PROSE

1) To Know When to Say "It's None of Your Business" - Mark Mccomack
2) Lottery Ticket - Anton Chekov
3) How To Be A Doctor Stephen Leacock

UNIT- III: EXENSIVE READER

1) Refund - Fritz Krithy
2) Karma – Khushwant Singh

UNIT- IV: GRAMMAR

1) Voice - Conversion of Sentences
2) Reported Speech
3) Degree of Comparison - Conversion of Sentences

UNIT- V: COMPOSITION

1) Job Application with Cover Letter & CV
2) Lodging Complaints

BOOK FOR STUDY:

WOR (L) D VIEW – Mainspring Publication

BOOKS FOR REFERENCE:

- High School English Grammar And Composition - Wren & Martin
- A Junior English Grammar And Composition - N. K. Agarwal

LEARNING OUTCOME:

On completion of this course the students

- Benefit with a wide range of English learning through Literary texts
- Strengthen their Grammar skills
- Are facilitated to write in simple English meaningful to their day to day situations

BHARATHI WOMEN'S COLLEGE (Autonomous) Part-I Hindi For B.A/B.Sc/B.Com Semester-I

Code: 19LBA

Hours Per Week: 6
Credits: 3

Stories grammar, technical terms and business & Official Letter Writing

I. Stories -4

1. Baadae ghar ki beti-Premchand

2. Majuburi-Mannu Bandri

3. Vo teraghar, Aac meraghar-Malathi Jhoshi

5. Ta1ii-Vishbhas Nath Sharma kaushik

Text Book: Kath Shree Edit By Dr. Vijaayapal Singh, Premchand Yadgiri Kahni Manu Bandri, Kahai book.

II. Grammar

1. Vilom shabdh/Pariyavachi Samanarti (1-20)

2. shudh Vakya Banyae (Make Sentence)

III. Letter Writing

1. Business Letters: Placement (Ordering books, A/c Open, Change of Address in post)

2. Official Letters:

1. Sarkari Letter

2. Order

3. Circular

IV. Techinical Terms: (Name of posts, Ministery Tipan 1-30)

SEMESTER-II

Prose/One act play (Detailed Text) & Journalism /General Essays/Annuvaad Practice

Hours per Weeks: 6 **Code: 19LBB**
Credits: 3

I. Prose

1. Sabiyatha ka rahisya (Santritik Niband)
2. Sikisha Aur Sanskar (Vyangya)
3. Sans-Bhuv private Limited (Sudrusan Mijitiya)

II. One Act play ,

Nakud natak

III. Journalism:-

1. Paribasha
2. Mahtwa
3. Prakar
4. Samachar Lekan

IV. General Essay (Any Five)

1.Audinik Naari

2.Auvudodikkaran (Vigyan & takniki)

3.Cell Phone

4.Global Warming (Pariyaran Pariskahan)

5.Internet

V. Translation practice Hindi To English

SEMESTER- III

PROSODY,ANCIENT POETRY,HISTORY OF HINDI LITERATURE

Code: 19LBC

Hours per week : 6

Credit: 3

1. **PROSODY:** Alankaar, upma, Rupak, Anupras, Athishyokthi

   Any Five Question: All nine Ras

2. **HISTORY OF HINDI LITERATURE:**

   (ADIKAL, BAKITIKAL AND REETIKAL PRAVITAYAHAN), KABIR KI PRAVITI

3. **ANCIENT POETRY:**

   Kabir ka doha: 1 to 10

   surdas: 2 paadh

   Rahim: 1 to 10

   Bihari: 1 to 10

   Ref: University syllabus

SEMESTER-IV

Modern poetry & Morden Literature Authors

Transalation Practice

1. Avdinek Kat-ki Pravitarjan 1. Chaya vad 2. Prokagovad 3. pragitirad

Code: 19LBD

I. Modern Literature Authors

1. Premchand
2. Bartendhu Harichandra
3. Mahadevi Varma
4. Harivansh Bachan
5. Janendra

II. Morden Poetry:-

1.Sukh-Dukh

Dinakar

2. Murjaya Huva

Phool - **Mahadevi Verma**

3. Apna Sansar

Mythili Sharan Gurt

4. Bachae Kaam Parja Rahae Hain

Rajesh Joshi

5. Unko pranam

Nagarajan.

III. Transulation

Ehglish to Hindi

BHARATHI WOMENS COLLEGE
(AUTONOMOUS)
CHENNAI-108

Hours Per Week: 2
Credit: 2
1 YEAR B.A./B.Sc./B.Com.,

Max Marks : 100
Code: 19NBX

Department of Hindi

Non Major Elective Course

II Semester

BASIC HINDI-1

OBJECTIVE :

To impart the knowledge of Hindi Language with the grammatical, per

UNIT I :

Alphabets-Combined Letters-Combination of Vowels and consonants-word construction-word building along with meanings.

UNIT II :

Vocabulary using words-Vocabulary sentence construction direct and indirect speech.

UNIT III :

Noun, Pronoun, change of gender and number, use of prepositions, opposite, Colour

UNIT IV:

Tense (Past tence, Presentence and Future tense

Department of Hindi

Non Major Elective Course

IV Semester

BASIC HINDI-II

Code: 19NBY

Hours Per Week: 2

Credit: 2

TEX BOOK :

Saral Hindi Bodhini-Pub. By D.B.Hindi Prachar Sabha, T.Nagar, Chennai-17 (14 to 23 lessons)

UNIT I : (Any 5)

Functional and situational practice of conversational and dialogues contexts 1) Personal contacts family members, friends, Travellers, enquiries etc. 2) Market, Purchasing complaints.

UNIT II :

Word making using suffixes and prefixes, sentences, types of sentences. 1. Presentence, Past tense, Future Tense

UNIT III :

Reading skills and comprehension topic (My family, college, Chennai) coding and decoding with sighs of communicated

UNIT IV :

Adjectives, Conjunction, Antonyms and Synonyms and numerical (30050)

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600 108.
B.A./B.Sc./B.Com.
SKILL BASED ELECTIVE – ENGLISH FOR COMMUNICATION I
(For the students admitted from the year 2019)

HOURS PER WEEK : 2 **SEMESTER : I**
CREDITS : 2 **SUBJECT CODE : 19SZ1**

OBJECTIVES:

- To enable the student
  - shed inhibitions and gain confidence
  - acquire proficiency in language.

ORAL COMPONENT

UNIT I

Greeting, Introducing, Seeking Permission

UNIT II

Telephone Etiquettes
Handling Calls – Mock Calls

UNIT III

Reading and Responding

WRITTEN COMPONENT

UNIT I

Giving Instructions and Directions

UNIT II

Leaving a Message
Asking for / Giving Message

UNIT III

Dialogue Writing(Guided)

- At an interview hall
- At the service centre
- In the library
- At the bank
- Making an apology

U1

Descripti、 Writing (Guided)

Technical (Features of a Cell Phone, Laptop, Camera, Television, Fridge)

UNIT V

Descriptive Writing (Guided)
General (Describing your locality/town/city libray, college campus, a place of historical importance, a festival.)

BOOKS FOR STUDY:

1. Spoken English for You by Radhakrishna Pillai, Emerald Publishers
2. Creative English For Communication by N. Krishnaswamy & T. Sriraman, Macmillan
3. Developing Communication Skills by Krishna Mohan & Meera Banerji, Macmillan

BOOKS FOR REFERENCE:

1. Form and Function by V. Sasikumar and V. Shyamala, Emerald Publishers
2. Developing Communication Skills by Krishna Mohan and Meera Bannerjee, Macmillan
3. Functional English by Dr. Malathi, New Century Book House

LEARNING OUTCOME:

On completion of this course the students

- Acquire the basics of Speaking and Presentation skills
- Understand the importance Non-verbal communication, gestures and general work place ethics
- Develop Writing skills for official purpose

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600 108.
B.A./B.Sc./B.Com.
SKILL BASED ELECTIVE – ENGLISH FOR COMMUNICATION II
(For the students admitted from the year 2019)

HOURS PER WEEK : 2 **SEMESTER : II**
CREDITS : 2 **SUBJECT CODE : 19SZ2**

OBJECTIVE:

- To equip the graduating students with skills essential for the workplace and facilitate a smooth mobility from the institution to the industry.

ORAL COMPONENT

UNIT I

Impromptu Talks

UNIT II

Group Discussion

UNIT III

Mock Interview (FAQs)

WRITTEN COMPONENT

UNIT I

Interviews
Managing nonverbal cues

UNIT II

Publicity Literature - Writing / Responding to Advertisements

UNIT III

Essay writing- Argumentative Essays (Guided)
Cell Phones/ Technology a boon or a bane
Role of youth in politics
Mother tongue as the medium of instruction
Dress code in colleges
Social Media - a distraction
Today's Youth- useless or used less?

UNIT IV

Reporting Events – Sports Day, Association Meeting, Cultural Celebration

UNIT V

Business Letters- Requests, Complaints, Placing Orders

BOOKS FOR STUDY:

1. Developing Communication Skills by Krishna Mohan & Meera Banerji, Macmillan
2. English for Business Communication by Dr. T.M. Farhathullah, Prism Books Pvt. Ltd.,
3. English for Competitive Exams by R.P. Bhatnagar

BOOKS FOR REFERENCE:

1. English and Softskills by S.P. Dhanavel, Orient Blackswan
2. Art of Interviewing by H.S Bhatia, Ramesh Publishing House, New Delhi
3. Written English for You by Radhakrishna Pillai & Rajeevan, Emerald Publishers

LEARNING OUTCOME:

On completion of this course the students

- comprehend the significance of Interviewing and Group Discussion skills
- Develop an inclination towards argument and knowledge of the current topics which are most debated
- Learn Basic approaches to communication skills and prepare themselves for their careers

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.
B.Sc.B.A.B.COM
SKILL BASED ELECTIVE – III
COMPUTING SKILLS-BASIC
(For the students admitted from the year 2019-20)

HOURS PER WEEK : 2. **SEMESTER : III**
CREDITS: 2 **SUBJECT CODE : 19SZ3**

UNIT I

Introduction to computers – characteristic of computers – computer generation – basic computer organization.

UNIT II

Processor and memory: Central Processing Unit – control unit – Arithmetic and Logic Unit (ALU) – instruction set – registers.

Main memory: main memory organization – RAM, ROM, PROM & EPROM.

UNIT III

Word processing: Creating a word document – saving word document – applying basic formatting – applying bulleted and numbers lists – using Find, Replace, Spell checker, Headers and Footers.

UNIT IV

Spreadsheets: Creating a new excel work book – saving excel work book – adding data to cells – insertion and deletion of cells – working with tables and charts – formulas and functions.

References:

- Computer fundamentals, 4th edition, Pradeep, K. Singh and Priti Sinha, BPB publications.
- Microsoft 2003, Jenifer Ackerman Kettell, Guy Hat, Davis Curt Simmons, Tata McGraw Hill.

BHARATHI WOMEN'S COLLEGE(AUTONOMOUS),CHENNAI-600 108.

B.Sc/B.A/B.Com.

SKILL BASED ELECTIVE - PERSONALITY DEVELOPMENT

(For the students admitted from the year 2019-2020)

HOURS/WEEK : 2
CREDITS : 2

SEMESTER : IV
SUBJECT CODE: 19SZ4

OBJECTIVES:

To provide the strategy for the growth of an individual. To create an awareness of interpersonal relations. To familiarize with the knowledge regarding the various causes of stress, types of stresses and various stress management strategies.

UNIT-1: Introduction to Personality Development:

Meaning of personality - Components of personality - Determinants of personality - Personality type - Role of personality development - Features of personality development- Need or Skills for personality development - Ways to develop personality - Tips to improve personality and lifestyle.

UNIT-2: Self Awareness and Self Motivation:

Components of Self Awareness - Importance of Self Awareness-Developing Self Awareness - Self Motivation in life - Self Motivation techniques - Steps for Self Motivation- Term self-esteem - Symptoms - Advantages - Do's and Don'ts to develop positive self-esteem.

UNIT-3: Interpersonal Relationships and Stress Management:

Interpersonal Relationships – Defining the difference between aggressive, submissive and assertive behaviours – Lateral thinking - Table Manners – Table Etiquettes in Multicultural Environment- Do's and Don'ts of Table Etiquettes - Stress Management – Meaning – Sources of Stress – Symptoms of Stress – Consequences of Stress – Managing Stress.

UNIT - 4: Time Management, Leadership and Decision Making:

Planning & Goal Setting - Dealing with other people - Analysis of goals and objectives - Systemization of processes – Prioritization- Leadership and qualities of a successful leader – Decision making steps for making an effective decision - Guideline to problem solving and decision making.

UNIT -5: Communication and Group Discussion:

Communication – Definition – Importance of communication – Process of communication - Communication Symbols – Communication network – Barriers in communication – Overcoming Communication Barriers - Group Discussion – Meaning – Personality traits required for Group Discussion- Process of Group Discussion.

BOOKS FOR STUDY:

1. Dr.K.R.Dhanalakshmi & Prof.N.S.Raghunathan, Personality Enrichment, Margham Publications, 2012.
2. Stephan P.Robbins, Organisational Behaviour, Tenth Edition, Prentice Hall of India Private Limited, New Delhi,2008.
3. Hurlock, E.B , Personality Development, 28th Reprint. New Delhi: Tata McGraw Hill, 2006.
4. Heller, Robert., Effective leadership. Essential Manager series. Dk Publishing, 2002.

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.

B.A., B.Sc., B.Com

ENVIRONMENTAL STUDIES

சுற்றுச்சூழல் கல்வி

(For the students admitted from the year 2019-20)

HOURS PER WEEK: 3 **SEMESTER: I**

CREDITS: 2 **SUBJECT CODE: 19EVS**

Objective

1. To develop awareness about the environment and the interaction of various components.
2. To understand about various ecosystems.
3. To make an awareness about various effects of pollution and its management.
4. To create an awareness about the biodiversity and need for its conservation.

Unit 1 : Introduction to Environment

Components of environment –atmosphere, hydrosphere, lithosphere and biosphere. Scope and importance

Ecosystem- Structure and function of ecosystem; Energy flow in an ecosystem: food chain, food web and ecological succession; Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems

Unit 2 : Natural Resources: Renewable and Non-renewable Resources

Land Resources- Land degradation, soil erosion and desertification.

Forest resources- Deforestation: Causes and impacts due to mining, dam building on environment,

Water resources- Use and over-exploitation of surface and ground water, floods, droughts,

Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources

Unit 3 : Biodiversity and Conservation

Levels of biological diversity: genetic, species and ecosystem diversity; Biogeography zones of India, hotspots

India as a mega-biodiversity nation; Endangered and endemic species of India, Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

Unit 4 : Environmental Pollution

Environmental pollution : types, causes, effects and controls; Air, water, soil, chemical and noise pollution

Nuclear hazards and human health risks

Solid waste management: Control measures of urban and industrial waste.

Unit 5 : Environmental Policies & Human Communities

Environment Laws : Environment Protection Act; Air (Prevention & Control o Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act Forest Conservation Act

Disaster management: floods, earthquakes, cyclones and landslides.

Environmental movements: Chipko, Silent valley

Books for Study:

1. Odum, E.P., Odum, h.T. & Andrews, J.1971. *Fundamentals of Ecology.* Philadelphia: Saunders.
2. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. *Ecology, Environmental Science and Conservation.* S. Chand Publishing, New Delhi.
3. Vijay Kumar Tiwari., 2017. A Text Book of Environmental Studies. Himalay Publishing House.

Books for Reference:

1. Carson, R. *2002. Silent Spring.* Houghton Mifflin Harcourt.
   Gadgil, M., & Guha, R.1993. This *Fissured Land:* An Ecological History of India. Univ. of California Press.
1. Gleeson,B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.
2. Gleick, P.H. 1993. Water in *Crisis*. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
3. Groom, Martha J. Gary K. Meffe, and Carl Ronald carroll. *Principles of Conservation Biology.*Sunderland: Sinauer Associates, 2006.
4. Rao, M.N. & Datta, A.K. 1987. *Waste Water Treatement.* Oxford and IBH Publishing Co. Pvt. Ltd.
5. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012. *Environment.* 8th edition. John Wiley & Sons.
6. Rosencranz, A., Divan, S., & Noble, M.L. 2001. *Environmental law and policy in India.* Tripathi 1992.
7. Sengupta, R. 2003.*Ecology and economics:* An approach to sustainable development. OUP.
8. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. *Conservation Biology: Voices from the Tropics.* John Wiley & Sons.
9. www.nacwc.nic.in
10. www.opcw.org

BHARATHI WOMEN'S COLLEGE (AUTONOMOUS), CHENNAI – 600108.

B.A., B.Sc., B.Com

VALUE BASED EDUCATION

(For the students admitted from the year 2019-20)

HOURS PER WEEK: 2 **SEMESTER: III**

CREDITS: 3 **SUBJECT CODE: 19VBE**

UNIT I

Value Education – Introduction – relevance to present day – concept of human values – personal values – the qualities of humanity to be followed by an individual – self introspection – self esteem.

அறிமுகம் - மதிப்புக்கல்வி விளக்கம் - இன்றைய சூழலில் மதிப்புக்கல்வி – மனித நேயத்தின் கருத்துகள் (அல்லது) மனித மதிப்புகள் - தனிமனிதன் பின்பற்ற வேண்டிய மனித நேயப் பண்புகள் - சுய சோதனை – சுய மரியாதை.

UNIT II

Family values – dependent – responsibility of the family - neutralization of anger – adjustability – threats of family life – status of women in family and society – the problems of day to day life faced by Indian women – caring for needy and elderly – the time allotment for sharing ideas and concerns.

குடும்பமும் குடும்பம் சார்ந்த மதிப்புகளும் - சார்ந்திருத்தல் - குடும்பத்தின் பொறுப்புகள் - கோபத்தைத் தணிப்பது – அனுசரித்துச் செல்வது – குடும்பத்திற்கு ஏற்படும் ஆபத்துகள் - ஆபத்துகளைப் போக்குவதற்கான வழிகள் - குடும்பத்திலும் சமுதாயத்திலும் பெண்களின் நிலை – தினசரி வாழ்க்கையில் இந்தியப் பெண்கள் சந்திக்கும் பிரச்சனைகள் - முதியோர் மற்றும் இயலாதோர் பாதுகாப்பும் பராமரிப்பும் - கருத்துப் பரிமாற்றத்திற்கு நேரம் ஒதுக்குதல்.

UNIT III

Ethical values – professional ethics – mass media ethics – advertisement ethics – influence of ethics on family life – psychology of children and youth.

Social values – faith, service and secularism – social sense and commitment – students and politics.

நெறிமுறைகள் - தொழில் நெறிமுறைகள் - மக்கள் தொடர்புச் சாதனங்களின் நெறிமுறைகள் - விளம்பர நெறிமுறைகள் - நெறிமுறைகளும் குடும்பங்களும் - குழந்தைகள், இளைஞர்கள் இவர்களின் உளவியல்.

சமுதாய மதிப்புகள் - சமய சார்பற்ற நம்பிக்கை, சேவை, மதச்சார்பின்மை – சமூகச் சிந்தனைகளும், கடமைகளும் - மாணவர்களும் அரசியலும்.

UNIT IV

Consumer's awareness, rights, responsibilities. Global issues – effect of international affairs on values of life – issues of globalization – modern war fare and terrorism – mutual respect for different culture, religion and their values.

நுகர்வோர் விழிப்புணர்ச்சி,உரிமைகளும்,கடமைகளும் - உலகம் சார்ந்தமதிப்பு– உலகநிகழ்வுகளால் ஏற்படும் தாக்கங்கள் - உலகஅளவில் ஏற்படும் மாற்றம் - நவீனபோர் முறையும் தீவிரவாதமும் - பிறமதங்கள் கலாசாரம் இவற்றைமதித்தல்.

BOOK FOR STUDY

மதிப்புக் கல்வி

K.R லஷ்மிநாராயணன்

ம. உமாமகேஸ்வரி

நெல்லையப்பர் பதிப்பகம்,

நெ.7,பிளாட் 7 கதவுஎண் ஏ1

39 ஆவதுதெரு,நங்கநல்லூர்,

சென்னை– 600 0611.

BOOK FOR REFERENCE

Value Education

Prof. N.S. Raghunathan M.A., M.Phil.

MARGHAM PUBLICATIONS.

T.NAGAR, CHENNAI – 17.