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 **APPLIED PHYSICS**

**Subject Code: BPHY0-101 L T P C Duration: 48 Hrs.**

 3 1 0 4

UNIT-I

**1. EM waves & Dielectrics (6 Hrs.)**

Introduction and physical significance of Gradient, Divergence & Curl, Dielectric polarization (qualitative only), Types of polarization, Displacement Current Maxwell’s Equations, Equation of EM waves in free space, velocity of EM waves, Poynting Theorem, Electromagnetic Spectrum (Basic ideas of different region).

**2. Quantum Theory (6 Hrs.)**

Need and origin of Quantum Concept, Wave-particle duality, Matter waves, Group & Phase velocities, Concept of Uncertainty Principle, wave function & its Significance, normalization of wave function, Schrodinger wave equation: time independent and dependent, Eigen functions & Eigen values, particle in a box in 1-D.

UNIT-II

**3. Elements of crystallography (6 Hrs.)**

Unit cell, Basis, Space lattice, Crystal Systems, Miller Indices of Planes & Directions in cubic system, Continuous & Characteristic X-Rays, X-Ray Diffraction & Bragg’s law in Crystals, Bragg’s spectrometer, X-ray radiography.

**4. Magnetic Materials & Superconductivity (7 Hrs.)**

Basic ideas of Dia, Para, Ferro & Ferri, Ferrites, Magnetic Anisotropy, Magnetostriction its applications in production of Ultrasonic waves, Superconductivity, Superconductors as ideal diamagnetic materials, Signatures of Superconducting state, Meissner Effect, Type I & Type II superconductors, Introduction to BCS theory, Application of superconductivity.

UNIT-III

**5. Lasers (6 Hrs.)**

Spontaneous & Stimulated emissions, Population Inversion, Pumping Mechanisms, Einstein’s Coefficients, Components of a laser System, Three and four level laser systems; Ruby, He-Ne, CO2 and semiconductor Lasers, Introduction to Holography.

6. **Fibre Optics (6 Hrs.)**

Introduction, Acceptance Angle, Numerical Aperture, Normalized frequency, Modes of propagation, material dispersion & pulse broadening in optical fibres, fibre connectors, splices and couplers, applications of optical fibres.

UNIT-IV

**7. Special Theory of Relativity (5 Hrs.)**

Concept of Ether, Michelson Morley Experiment, Einstein’s postulates, Lorentz transformation equations; length, time and simultaneity in relativity, addition of velocity, variation of mass with velocity (concept only), Mass-Energy and Energy-momentum relations.

**8. Nanophysics (6 Hrs.)**

Nanoscale, surface to volume ratio, electron confinement, nanoparticles (1D, 2D, 3D), Nanomaterials, Unusual properties of nanomaterials, synthesis of nanomaterials- ball milling and sol-gel techniques, Carbon nanotubes (synthesis and properties), applications of nanomaterials.

**Assignments**

**ASSIGNMENT-1**

1. Show that the curl of the velocity of any particle of a rigid body is eual to twice the angular velocity of the body.
2. Find the constants a,b,c so that the Vector A=(x+2y+az)i + (bx-3y-z)j + (4x+cy+2z)k is irrotational.
3. Show that divergence of curl of a vector field always zero.
4. What is Poynting vector and give its significance?State and prove Poynting vector theorem.
5. What is meant by stationary current?Prove that for stationary current div J=0
6. What is physical significance of gradient of a function.

**ASSIGNMENT-2**

1. What is energy time uncertainty relation?
2. State and explain normalization of a wave function.
3. Give the applications of uncertainty principle.
4. Explain Type I & Type II superconductors?
5. Give detail about Unit cell, Basis, Space lattice?
6. Explain Bragg’s spectrometer?

**ASSIGNMENT-3**

1. What are magnetic domains.
2. What do you mean by domain theory.
3. Define magnetostriction and magnetic anisotrophy.
4. What are soft and hard magnets.
5. Explain Spontaneous & Stimulated emissions?
6. Explain Components of a laser System and describeThree & four level laser systems?

**ASSIGNMENT-4**

1. Explain fibre connectors?
2. Explain applications of optical fibres?
3. Explain Einstein‟s postulates and concept of ether?
4. Explain Modes of propagation in fibre optics?
5. What is the concept of ether.
6. Explain Length contraction from theory of relativity.

**ASSIGNMENT-5**

1. Explain in detail the Carbon nanotubes and synthesis of carbon nano tubes?
2. Explain in detail the properties of carbon nanotube?
3. Explain the. properties of nanomaterials?
4. Describe in detail about the synthesis of nanomaterials?
5. Describe in detail about the synthesis of nanomaterials?
6. Describe Nanoscale and the electron confinement in detail?

**APPLIED MATHEMATICS-I**

**Subject Code: BMAT0-101 L T P C Duration: 48 Hrs.**

 4 1 0 5

**Learning objectives**

To introduce the concepts and to develop working knowledge on matrix theory, Complex numbers, Convergence of infinite series and concepts of differential equations.

UNIT-I

**1. Linear Algebra (10 Hrs.)**

Elementary transformations, Rank of a matrix, Row reduced echelon form, Reduction to normal form, Linear independence and dependence of vectors, Gauss- Jordan method to find inverse of a matrix, Solution of simultaneously linear algebraic equations, Linear transformations, Orthogonal transformations, Eigen values and eigen vectors, Cayley-Hamilton theorem, Reduction to diagonal form, Orthogonal, Unitary, Hermitian matrices.

UNIT-II

**2. Complex Numbers and Elementary Functions of Complex Variable** (**11 Hrs.)**

De-Moivre’s theorem and its applications, Real and imaginary parts of exponential, Logarithmic, circular, Inverse circular, Hyperbolic, Inverse hyperbolic functions of complex variables. Summation of trigonometric series (C+iS method).

UNIT-III

**3. Sequence and Series (11 Hrs.)**

Introduction to sequence and series, Convergence and divergence of series, Tests of convergence (without proofs), Comparison test, Integral test, Ratio test, Raabe’s test, Logarithmic test, Cauchy’s root test and Gauss test. Alternating series- Absolute and conditional convergence, Leibnitz test. Power series-Weirstrass M-test

UNIT-IV

**4. Differential Equations and its Applications (3 Hrs.)**

Leibnitz’s linear and Bernoulli’s equation, Exact differential equations, Equations reducible to exact form by integrating factors, Equations of the first order and higher degree, Clairaut’s equation.

Solution of linear ordinary differential equations of second and higher order; Methods of finding complementary functions and particular integral, Special methods for finding particular integrals- Method of variation of parameters. Cauchy’s homogeneous and Legendre’s linear equation. Simultaneous linear equations with constant coefficients.

Applications to electric R-L-C circuits, Deflection of beams, Simple harmonic motion, Simple pendulum.

 **Assignment-1**

**Topic matrix (In linear algebra)**

1. Find the rank of the following matrices

 i. $\left[\begin{matrix}1&4&5\\2&6&8\\3&7&9\end{matrix}\right]$

ii. Diag matrix [-1 0 1 0 0 4]

1. Using matrix method, show that the equations

3x+3y+2z=1, x+2y=4, 10y+3z=-2, 2x-3y-z=5 are consistent and hence obtain the solution for x,y and z.

1. If ƛ is an eigen value of the matrix A, then prove that g(ƛ) is an eigen value of g(A), where g is polynomial.
2. Define elementary of matrix.
3. Cayley Hamilton theorem.
4. Using cayley Hamilton theorem, find the inverse of

 $\left[\begin{matrix}2&5&3\\3&1&2\\1&2&1\end{matrix}\right]$

7. Prove that the following matrix is orthogonal.

 $\left[\begin{matrix}1&2&2\\2&1&-2\\2&-2&1\end{matrix}\right]$

 **Assignment 2**

**Topic: complex number and elementary function**

1. De-Mover's theorem.
2. Simplify $\frac{\cos(θ)+i\sin(θ)}{\sin(θ)+i\cos(θ)}$
3. if x+ $\frac{1}{x}$ = 2 cosθ, y+$\frac{1}{y}$=2cosɸ, prove that one of the values of $ \frac{x^{m} }{y^{n}}+\frac{y^{n}}{x^{m}}$ is 2cos (mθ-nɸ)
4. Find the values of(-1) 1/6
5. if (3+x)3 -(3-x)3=0 than prove that x=3 itam rΠ

 r=0,1,2 3

1. Expand cos5θ sin7θ in a series of sines of multiples of θ
2. Express log (logi) in the form A+iB.
3. Find modules and arrangement of (1+i)1-i
4. Separate into real and imaginary parts log sin(x+iy)

**Assignment 3**

**Topic: infinite series**

1. Convergent and divergent of sequence.
2. Comparison test
3. Ratio test, logarithmic test
4. Cauchy integral test
5. Test the convergence of the series

**∞**

**Ʃ 8 tanˉˡ n/ 1+n2**

**n=1**

1. Test the convergence.

 **∞**

 **(a) Ʃ 1/ (**logn)n (b) **Ʃ (1+1/n)-**$n^{2}$

n=1

1. Discuss the convergence of the following series

 1+ 2p/2! + 3p/3! +4p/4! +……

**Assignment 4**

**Topic: Ordinary differential equations of first order**

1. Solve $\frac{dy}{dx}$= sin(x+y)
2. Solve x cosx cosy+ siny$\frac{dy}{dx}$ =0
3. Find the general solution of the differential equation

(2xy+x2) y1= 3y2+2xy

1. Solve (sex tanx tany- ex) $\frac{dx}{dy}$+ sec x sec2y dy =0
2. Solve (1+y2) dx = (tan1y-x) dy
3. solve $\frac{dy}{dx}$ =x sin2y = x3 cos2y

 **Assignment 5**

**Topic: Differential equations of second and higher order.**

1. solve $y^{''}$ + 4y = x sin2x
2. solve (D-2)2y =8 (e2x+sin2x+x2)
3. solve $y^{''}$- 2$y^{,}$ + y = xex sinx
4. solve y”-6y’+9y= e3x x-2 by variation of parameter method
5. solve xy” +xy’= logx sin (logx)
6. solve $\frac{dx}{dt}$+2y=et and $\frac{dy}{dt}$- 2x= e-t
7. solve $\frac{dx}{dt}$ +4x+3y = t and $\frac{dy}{dt}$ +2x+5y = et

**COMMUNICATIVE ENGLISH**

**Subject Code: BHUM0-101 L T P C Duration: 45 Hours**

 2 1 0 3

UNIT-I (12 Hrs)

**Communication:** Meaning, its types, Significance, Process, Channels, Barriers to Communication, Making Communication Effective, Role in Society.

**Business Correspondence:** Elements of Business Writing, Business Letters: Components and Kinds, Memorandum, Purchase Order, Quotation and Tenders, Job Application Letters, Resume Writing etc.

UNIT-II (10 Hrs)

**Discussion Meeting and Telephonic Skills:** Group Discussion, Conducting a Meeting, Telephone Etiquettes, Oral Presentation: Role of Body Language and Audio Visual Aids.

**Grammar:** Transformation of Sentences, Words used as Different Parts of Speech One Word Substitution, Abbreviations, Technical Terms etc.

UNIT-III (11 Hrs)

**Reading Skills:** Process of reading, Reading Purposes, Models, Strategies, Methodologies, Reading Activities.

**Writing Skills:** Elements of Effective Writing, Writing Style, Technical Writing: Report Writing.

UNIT-IV (12 Hrs)

**Listening Skills:** The process of Listening, Barriers to Listening, Effective Listening Skills and Feedback Skills.

**Speaking Skills:** Speech Mechanism, Organs of Speech, Production and Classification of Speech Sound, Phonetic Transcription, Skills of Effective Speaking, Components of Effective Talk.

**Assignment-1**

1. Communication : Definitions, Meaning & Process
2. Role of communication in society

**Assignment-2**

1. Business Letters: Components and Kinds
2. Job Application Letters
3. Resume writing

**Assignment-3**

1. **Reading Skills:** Process of reading, Reading Purposes, Models
2. Strategies, Methodologies, Reading Activities

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**Assignment-4**

1. **Writing Skills:** Elements of Effective Writing
2. Report Writing.
3. Reports on different topics

**Assignment-5**

1. **Speaking Skills:** Speech Mechanism
2. Organs of Speech, Production and Classification of Speech Sound
3. **Phonetic transcription**

**BASICS OF ELECTRICAL ENGINEERING**

**Subject Code: BELE0-101 L T P C Duration: 22 Hrs.**

2 0 0 2

UNIT-I

**1. Review of Direct Current (DC) Circuits (4 Hrs.)**

Review of circuit elements and connected terminology, Kirchoff‟s Laws- Statement and Illustrations, Star-Delta Conversion, Ohm’s Law- Statement, Illustration and Limitation, Effect of Temperature on Resistance.

UNIT-II

**2. Alternating Current (AC) Fundamentals (5 Hrs.)**

Generation of alternating electro-motive force (EMF), Peak, Root Mean Square and average value of alternating current, Phasor representation of alternating quantities, Alternating Quantities in Rectangular and polar forms. Introduction of Resistive, Inductive & Capacitive circuits and their series and parallel combinations, Concept of resonance in series and parallel circuits.

**3. Three Phase Balanced Systems (4 Hrs.)**

Concept of 3-phase EMF Generation, Numbering of phases, phase sequence, Types of connections: star and delta connections, relationship between line voltages/currents and phase voltages/currents, Phasor diagrams.

UNIT-III

**4. Magnetic Circuits and Transformer (5 Hrs.)**

Comparison between magnetic and electric circuits, Electromagnetic Induction and its law, Self-Inductance, Mutual Inductance, Coupling Coefficient between two magnetically coupled circuits. Single Phase Transformer: Construction, Working principle, Losses & Efficiency.

UNIT-IV

**5. Rotating Electrical Machines (4 Hrs.)**

Construction and working principle of D.C. machines (series and shunt), three phase Induction motor (squirrel cage and slip ring) and their applications**.**

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**Assignment: 1**

1. Explain the methods of solving circuits by Kirchoff‟s laws.
2. Explain Star-Delta Conversion.
3. What do you mean by Ohms Law? Give its Statement, Illustration and Limitations

**Assignment: 2**

1. Explain the phasor representation of alternating quantities.
2. Explain the analysis of AC Circuit Representation of Alternating Quantities in Rectangular and polar forms.
3. What do you mean by RLC series circuit? Explain.

**Assignment: 3**

1. What do you mean by Coupling Coefficient between two magnetically coupled circuits?
2. Explain Comparison between magnetic and electric circuits.
3. Why transformer cannot be operated on dc supply?

**Assignment: 4**

1. What is the condition for parallel resonance?
2. What is the relationship between line voltages/currents and phase voltages/currents in star delta connections?
3. What is the working principle of transformer? Explain its construction and working.

**Assignment: 5**

1. What do you mean by voltage regulation?
2. Explain the construction and working of Synchronous machines (motors and generators).
3. Explain the classification of DC motors.

**HUMAN VALUES & PROFESSIONAL ETHICS**

**Subject Code: BHUM0-103 L T P C Duration: 24 Hrs**

 2 0 0 2

**UNIT-I (6 Hrs)**

**Course Introduction - Need, Basic Guidelines, Content and Process for Value Education**

Understanding the need, basic guidelines, content and process for Value Education. Self-Exploration-what is it? - its content and process; “Natural Acceptance” and Experiential Validation- as the mechanism for self-exploration, Continuous Happiness and Prosperity- A look at basic Human Aspirations Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority, Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario Method to fulfill the above human aspirations: understanding and living in harmony at various levels

**UNIT-II (8 Hrs)**

**Understanding Harmony in the Human Being - Harmony in Myself!**

Understanding human being as a co-existence of the sentient “I” and the material “Body”

Understanding the needs of Self (“I‟) and “Body” - *Sukh* and *Suvidha*

Understanding the Body as an instrument of “I” (I being the doer, seer and enjoyer)

Understanding the characteristics and activities of “I” and harmony in “I”

Understanding the harmony of I with the Body: *Sanyam* and *Swasthya*; correct appraisal of Physical needs, meaning of Prosperity in detail, Programs to ensure *Sanyam* and *Swasthya*

**Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship**

Understanding harmony in the Family- the basic unit of human interaction; Understanding values in human-human relationship; meaning of *Nyaya* and program for its fulfillment to ensure *Ubhay-tripti*; Trust (*Vishwas)* and Respect (*Samman)* as the foundational values of relationship; Understanding the meaning of *Vishwas*; Difference between intention and competence Understanding the meaning of *Samman*, Difference between respect and differentiation; the other salient values in relationship

**UNIT-III (6 Hrs)**

**Understanding the Harmony in the Society (Society Being an Extension of Family)**

*Samadhan, Samridhi, Abhay, Sah-astitva* as comprehensive Human Goals Visualizing a universal harmonious order in society- Undivided Society (*Akhand Samaj),* Universal Order (*Sarvabhaum Vyawastha )*- from family to world family!

**Understanding Harmony in the Nature and Existence - Whole existence as Co-existence**

Understanding the harmony in the Nature; Interconnectedness and mutual fulfillment among the four orders of nature- recyclability and self-regulation in nature; Understanding Existence as Co-existence (*Sah-astitva*) of mutually interacting units in all-pervasive space; Holistic perception of harmony at all levels of existence

**UNIT-IV (4 Hrs)**

**Implications of the above Holistic Understanding of Harmony on Professional Ethics**

Natural acceptance of human values Definitiveness of Ethical Human Conduct; Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order; Competence in professional ethics:

Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems,

Ability to identify and develop appropriate technologies and management patterns for above

production systems;

Case studies of typical holistic technologies, management models and production systems; Strategy for transition from the present state to Universal Human Order:

At the level of individual: as socially and ecologically responsible engineers, technologists and managers

At the level of society: as mutually enriching institutions and organizations

**Assignments**

 **Assignment-1**

Q1) What is the value education?

Q2) What is the need of the value education in technology institutes?

Q3) How will you differentiate between belief and understanding?

Q4) What do you understand by the term self realization. How can it be performed?

Q5) How does the value education help in fulfilling one’s aspiration?

Q6) Explain the basic guidelines for value education?

**Assignment-2**

Q1) Define self exploration. What is the content of self exploration?

Q2) What do you understand by the term experimental validation and natural acceptance?

Q3) “Process of self exploration leads to realization and understanding. “explain?

Q4) Illustrate the purpose of self exploration .

Q5) What do you understand by terms swatva, Swantantrata and swaraj.how ar they related to each other?

Q6) “Natural acceptance is variant,innate and universal.” Explain it.

**ENVIRONMENTAL SCIENCE**

**Subject Code: BESE0-101 L T P C Duration: 48 Hrs.**

2 0 0 2

**UNIT-I**

**1. The Multidisciplinary Nature of Environmental Studies (2 Hrs.)**

Definition, scope and importance. Need for public awareness.

**2. Natural Resources (2Hrs.)**

**Renewable and Non-renewable Resources:**

Natural resources and associated problems.

(a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber

extraction, mining, dams and their effects on forests and tribal people.

(b) Water resources: Use and over-utilization of surface and ground water, floods,

drought, conflicts over water, dams-benefits and problems.

(c) Mineral resources: Use and exploitation, environmental effects of extracting and

using mineral resources, case studies.

(d) Food resources: World food problems, changes caused by agriculture and

overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water

logging, salinity, case studies.

(e) Energy resources: Growing energy needs, renewable and non-renewable energy

sources, use of alternate energy sources, case studies.

(f) Land resources: Land as a resource, land degradation, man induced landslides,

soil erosion and desertification.

(g) Role of an individual in conservation of natural resources.

(h) Equitable use of resources for sustainable lifestyles.

**UNIT-II**

**3. Ecosystems (8 Hrs.)**

(a) Concept of an ecosystem.

(b) Structure and function of an ecosystem.

(c) Producers, consumers and decomposers.

(d) Energy flow in the ecosystem.

(e) Ecological succession.

(f) Food chains, food webs and ecological pyramids.

(g) Introduction, types, characteristic features, structure and function of the following ecosystem:

i) Forest ecosystem.

ii) Grassland ecosystem.

iii) Desert ecosystem.

iv) Aquatic ecosystems (ponds, streams, lakes, rivers, ocean estuaries).

**4. Biodiversity and its Conservation (6 Hrs.)**

(a) Introduction – Definition: genetic, species and ecosystem diversity.

(b) Biogeographical classification of India.

(c) Value of biodiversity: consumptive use, productive use, social, ethical aesthetic and

(d) option values.

(e) Biodiversity at global, national and local levels.

(f) India as a mega-diversity nation.

(g) Hot-spots of biodiversity.

(h) Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts.

(i) Endangered and endemic species of India.

(j) Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

**UNIT-III**

**5. Environmental Pollution (8Hrs.)**

Definition

(a) Causes, effects and control measures of:

i) Air pollution

ii) Water pollution

iii) Soil pollution

iv) Marine pollution

v) Noise pollution

vi) Thermal pollution

vii) Nuclear pollution

(b) Solid Waste Management: Causes, effects and control measures of urban and

industrial wastes.

(c) Role of an individual in prevention of pollution.

(d) Pollution Case Studies.

(e) Disaster management: floods, earthquake, cyclone and landslides

**6. Social Issues and the Environment (8 Hrs.)**

(a) From unsustainable to sustainable development

(b) Urban problems and related to energy

(c) Water conservation, rain water harvesting, Watershed Management

(d) Resettlement and rehabilitation of people; its problems and concerns. Case studies.

(e) Environmental ethics: Issues and possible solutions

(f) Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.

(g) Wasteland reclamation

(h) Consumerism and waste products

(i) Environmental Protection Act

(j) Air (Prevention and Control of Pollution) Act

(k) Water (Prevention and control of Pollution) Act

(l) Wildlife Protection Act

(m) Forest Conservation Act

(n) Issues involved in enforcement of environmental legislation

(o) Public awareness

**UNIT-IV**

**7. Human Population and the Environment (7 Hrs.)**

(a) Population growth, variation among nations

(b) Population explosion – Family Welfare Programmes

(c) Environment and human health

(d) Human Rights

(e) Value Education

(f) HIV/AIDS

(g) Women and Child Welfare

(h) Role of Information Technology in Environment and Human Health

(i) Case Studies

**8. Field Work (6 Hrs.)**

(a) Visit to a local area to document environmental assets river/

(b) forest/grassland/hill/mountain

(c) Visit to a local polluted site – Urban / Rural / Industrial / Agricultural

 (d) Study of common plants, insects, birds

(e) Study of

**ASSIGNMENT 1**

1. Explain the importance of value education, awareness and community participation in environment protection activities in India.2. Discuss the following with your comments also:

(a) Chipko movement

(b) Narmada BachaoAndolan

3. Discuss the importance of multi-disciplinary nature of environmental studies.

4. What are the problems associated with construction of large dams?

5. What are the major causes and consequences of deforestation? Discuss.

6. How can an individual play a role in conserving the natural resources?

**ASSIGNMENT 2**

1. Explain with neat sketch about the energy and nutrients flow through an ecosystem.

2. What is ecological succession? Describe the causes of ecological succession.

3. What are ecological pyramids? What are various types of ecological pyramids?

4. What are food chains and food webs?

5. Define producers, consumers and decomposers. Quote their role alongwith their examples.

**ASSIGNMENT 3**

1. Discuss case study on TajMahal.

2. How does soil pollution differ from water pollution in effects and control?

3. Discuss the various causes, effects and control measurements of Urban and Industrial waste.

4. What are the harmful effects of air pollutants? How can we prevent and control air pollution?

5. Give a brief account of the earthquake.

**ASSIGNMENT 4**

1. What is acid rain? What are the adverse effects of acid rain?

2. State chief characteristic features of forest conservation act.

3. Explain the phenomenon of Global warming? What are its major causes?

4. What is Ozone hole? How does it form?

5. What is meant by wasteland reclamation? Discuss the possible methodology.

**ASSIGNMENT 5**

1. Describe the problems faced by a child working as a bonded labourer in one of the hazardous industries.

2. How is information technology related to the cause of better human health?

3. Write short notes on:

(a) Human rights

(b) Population explosion

(c) Value education

(d) Women and child welfare

(e) Environmental ethics

**APPLIED PHYSICS LAB.**

**Subject Code: BPHY0-102 L T P C**

0 0 2 1

**LIST OF PRACTICALS**

1. To study the magnetic field of a circular coil carrying current.

2. To find out polarizability of a dielectric substance.

3. To study the laser beam characteristics like; wave length using diffraction grating element.

4. Study of diffraction using Laser beam and thus to determine the grating element.

5. To study the angular divergence of laser beam.

6. To study laser interference using double slit or Michelson’s Interferometer.

7. To determine numerical aperture of an optical fibres

8. To determine attenuation and propagation losses in optical fibres.

9. To find out the frequency of AC mains using electric-vibrator.

10. To find the refractive index of a material (solid or liquid) using spectrometer.

11. To study the B-H curve using CRO.

12. To determine the grain size of a material using optical microscope.

13. To find the velocity of ultrasound in liquid.

**COMMUNICATIVE ENGLISH LAB**

**Subject Code: BHUM0-102 L T P C**

0 0 2 1

The following course content is prescribed for the Communicative English Laboratory sessions:

1. Introduction to the Sounds of English- Vowels, Diphthongs & Consonants.

2. Introduction to Stress and Intonation.

3. Situational Dialogues / Role Play.

4. Oral Presentations- Prepared and Extempore.

5. ‘Just A Minute’ Sessions (JAM).

6. Describing Objects / Situations / People.

7. Information Transfer

8. G.D. and Debate

The teacher may use following different classroom techniques to give practice and monitor the progress of the students:

 Role Play

 Question-Answer

 Discussion

 Presentation of Papers

 Seminars etc.

**BASICS OF ELECTRICAL ENGINEERING LAB.**

**Subject Code: BELE0-102 L T P C**

0 0 2 1

**List of Experiments**

**Group-I**

1. To verify Ohm’s law and its limitations.

2. To verify Kirchoff’s Laws (KVL and KCL)

3. To measure the resistance and inductance of a coil by ammeter-voltmeter method.

4. To find voltage-current relationship in a R-L series circuit and to determine the power factor of the circuit.

**Group-II**

5. To verify the voltage and current relations in star and delta connected systems.

6. To measure power and power factor in a single- phase AC circuit.

7. To Study the various types of switches like Relays, SPST, DPST, MCB and Stair case switch.

**Group-III**

8. To study the principle of fluorescent lamp.

9. To verify the rating of compact fluorescent lamp (CFL).

10. To Study the home power supply system.

**Group-IV**

11. To perform open- and short circuit tests on a single phase transformer and calculate its efficiency

12. To start and reverse the direction of rotation of a

i) DC motor

ii) Induction motor

ctice (Right Angles), male- Female mating parts practice, trapping practice.

**MANUFACTURING PRACTICES**

**Subject Code: BMFP0-101 L T P C**

 1 0 6 4

Introduction of various manufacturing practices, tools and equipment used, Hand on experience by making different jobs in respective shops like:

1. Machine Shop

2. Sheet Metal Shop

3. Fitting Shop

4. Welding Shop

5. Carpentry and Pattern Making Shop

6. Forging Shop

7. Foundry Shop

8. Electrical and Electronics Shop