School of Electrical & Electronics Engineering

B.Tech. Electrical & Electronics Engineering
B.Tech. Electronics & Communication Engineering
B.Tech. Electronics & Instrumentation Engineering
M.Tech. Power Systems (5 Year Integrated Programme)
M.Tech. Communication Systems (5 Year Integrated Programme)
M.Tech. Instrumentation & control (5 Year Integrated Programme)

(Scheme & Syllabi under Choice-Based Credit System)
(For students admitted in 2009 - 2010 and subsequently)
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L –Lecture  T –Tutorial  P –Practical
NUMBER OF PERIODS: 45  CREDITS: 03

OBJECTIVES

English I – Strategies in Communication undertakes to introduce B.Tech. students to the general aspects of communication, with special emphasis on Scientific discourse. In Unit I seven literary texts are introduced as communication models to be used for training students in LSRW skills through their active discussion, role play and presentation. Unit II is concerned with speech practice in various interpersonal interactions. Some basic rules to pronunciation are also introduced. Unit III deals with developing reading skills through comprehension, note-making and summarizing. Unit IV concerns itself with writing at micro level – various vocabulary and grammatical features of writing. Unit V aims at introducing students to discourse features and paragraph writing. At the end of the course, the learners will be able to use all the four skills – listening, speaking, reading and writing with confidence on various topics of general interest.

METHODOLOGY

There will be less and less of teacher talking and more and more of student participation in terms of pair/small group/large group discussions and seminar presentations.

EVALUATION

There will be no questions on the theories of communication. Students will write 10 assignments and 3 tests at the formative stage. There will be a summative examination of 3 hours. The formative and summative tests will be so designed that they will help assess the learning outcome of the programme in terms of student performance.

UNIT I: TEXTS

1. Resolution and Independence – William Wordsworth
2. The Turning Point of My Life – A.J. Cronin
3. My Vision for India – A.P.J. Abdul Kalam
4. Profession for Women – Virginia Woolf
5. A Cup of Tea – Katherine Mansfield
6. Never, Never, Nest – Cedric Mount
7. Refund – Fritz Karinthy (Adapted by Percival Wilde)

(TO BE USED FOR TRAINING STUDENTS IN LSRW SKILLS THROUGH ROLE PLAY, PRESENTATION etc.)

UNIT II: SPEECH PRACTICE

A. Some basic rules to Spoken English
   1. Introduction to Phonetic Symbols
   2. Pronunciation of Initial, Medial and Final /r/, /ture/, and /tion-sion-cion/
   3. Different ways in which ‘f’ sound gets represented
   4. Silent letters
   5. Word and sentence stress rules
   6. Punctuation as a guide to pause
   7. Intonation
   8. Accent Neutralization

B. Interpersonal interaction
   1. Greeting
   2. Introductions
   3. Making requests
4. Seeking permission, advice, suggestions
5. Asking for information
6. Congratulating
7. Apologizing
8. Asking for and giving personal information
9. Complaining without offending

(FOR INTERNAL ASSESSMENT ONLY)

UNIT III: READING
1. Comprehension
2. Note-making and summarizing

UNIT IV: WRITING: MICRO STRUCTURE
Special application of Vocabulary and Grammatical elements in Science and Technology
i. Concord – Subject - Verb; Noun - Pronoun
ii. Appropriate Verb Forms: aspects, questions and negatives
iii Use of Modal Auxiliaries
iv. Disambiguating words/phrases/sentences
v. Tightening the rambling sentences with regard to simplicity, clarity and precision
vi. Indianisms – Words, Sentence patterns
vii. Analytical Reasoning and Language Use

UNIT V: WRITING: MACRO STRUCTURE
1. Cohesion and Coherence
2. Discourse patterns/strategies – narration, description, process writing, enumeration, Classification, definition, comparison and contrast, cause and effect, and argument
3. Paragraph Writing: Topic Sentence and its expansion
4. Essay Writing

Text Book: Strategies in Communication – SASTRA Publications

Books for Reference:


MATHEMATICS – I

NUMBER OF PERIODS: 60

UNIT: 1

TRIGONOMETRY: Expansions of \( \sin n\theta \) and \( \cos n\theta \) in powers of \( \sin\theta \) and \( \cos\theta \) – Expansions of \( \sin^n\theta \) and \( \cos^n\theta \) in terms of sines and cosines of multiples of \( \theta \) – Hyperbolic and inverse hyperbolic functions – logarithm of complex numbers – separation of complex functions into real and imaginary parts – simple problems.

UNIT: 2


ALGEBRA: Binominal, Exponential and logarithmic series (without proof) – problems on summation, coefficient and approximations.

UNIT: 3

DIFFERENTIAL CALCULUS: Curvature of curve – Radius of Curvature (Cartesian polar, parametric and implicit form) – Evolutes – Involutes – Envelopes (one parameter and two parameter) – Evolute as the envelope of normals

FUNCTIONS OF SEVERAL VARIABLES: Maxima and Minima of functions of two variables (proofs of theorems are not included) – Constrained Maxima and Minima – Lagrange’s method of multipliers.

UNIT: 4

IMPROPER INTEGRALS: Concept of improper integrals with examples – Definition of Beta and Gamma integrals – Relations between them – properties of Beta and Gamma integrals with proofs – Evaluation of definite integrals in terms of Beta and Gamma integrals – simple applications (evaluation of double and triple integrals)


Text Book:


References:


NUMBER OF PERIODS: 60                         CREDITS: 04

UNIT: 1                                      (15 Periods)

CONTROL STRUCTURE: Conditional constructs – control constructs – Multiple branching – Iteration and jump constructs.

UNIT: 2                                      (15 Periods)

ARRAY: Declaration – Initialization and manipulation of single & multidimensional array - String Handling, String Manipulations and character handling functions – String manipulation operations
FUNCTION: Declarations – Definition – Scope – Arguments – Call by reference & value – Recursion-storage classes – preprocessor directives

UNIT: 3                                      (15 Periods)

POINTERS: Declarations – Accessing through pointers – pointer and character strings – pointer to pointer – Pointers in array, Structure and functions – Dynamic memory allocation

UNIT: 4                                      (15 Periods)

FILES: Sequential Access-Random Access-operating & closing file – file processing using file manipulation functions
GRAPHICS: Detect, Initiate and close graph primitive drawing functions (circle, line, ellipse, rectangle and images) – Sound and motion functions.

Text Book:

References:
3. Byron Gottfried “Programming with C” TMII, 2000
ENGINEERING CHEMISTRY

NUMBER OF PERIODS: 60
CREDITS: 04

UNIT: 1
(15 Periods)

UNIT: 2
(15 Periods)

UNIT: 3
(15 Periods)

UNIT: 4
(15 Periods)
CORROSION & PROTECTIVE COATINGS: Chemical and electrochemical corrosions, Factors influencing corrosion, Mechanism of rusting of iron in acid neutral and alkaline environments, Differential metal corrosion ,Differential aeration,Atmospheric and soil corrosion,Control of corrosion,Anodic and cathodic protections ,corrosion inhibitors. Importance of selection of materials and design of structural patterns in corrosion control


Text Book:

References:
BEECCE 105/ BECCCE 105/ BEICCE 105/ MPSCE105/ MCSCCE 105/MICCCE 105
ENGINEERING DRAWING

NUMBER OF PERIODS: 60

UNIT: 1


UNIT: 2

PROJECTION OF POINTS, LINES AND SOLIDS: General principles of orthographic projections – First angle projection – projection of points located in all quadrants – projection of straight lines located in the first quadrant: determination of true lengths and true inclinations – Projections of Solids: prisms, pyramids, cylinders and cones (Truncated solids not included) – change of position method and change of reference line method.

UNIT: 3

SECTION OF SOLIDS AND DEVELOPMENT OF LATERAL SURFACES: Section of solids: true shape of sections – development of lateral surfaces of solids: prisms, pyramids, cylinders and cones

UNIT: 4

ISOMETRIC PROJECTION AND BUILDING DRAWING: Principles of Isometric projection – Isometric projections of simple and truncated solids: prisms, cylinders and cones. Introduction to building drawing: simple problem on residential building (up to three rooms).

Text Books:


References:

BEECME106/BECCME 106/BEICME 106/MPSCME 106/MSCME 106/MICCME106
BASIC MECHANICAL ENGINEERING

NUMBER OF PERIODS: 45  
CREDITS: 03

UNIT: 1  
(12 Periods)


STEAM GENERATORS AND TURBINES: Boilers- Classification and types of Boilers- Cochran - Babcock and Wilcox – Lamont Benson Boiler Mounting and Accessories-Turbines- Classification – Construction and Working Principle of simple Impulse and Reaction turbines


UNIT: 2  
(11 Periods)


UNIT: 3  
(11 Periods)


UNIT: 4  
(11 Periods)


METAL MACHINING: Main components and Functions of centre Lathe – Radial Drilling Machine and Shaping Machine -. Operations-Introduction to CNC Machines

Text Book:

References:
1. S.Rao and Dr.B.B.Parulekar, “Energy Technology”, Khanna Publishers
2. G.R.Nagpal, “Power Plant Engineering”, Khanna Publishers
BEECCE 107/ BECCCE 107/ BEICCE 107/ MPSCE 107/ MCSCCE 107/
MICCCE 107
BASIC CIVIL ENGINEERING

NUMBER OF PERIODS: 45 CREDITS: 03

UNIT: 1

Role of Civil Engineer in a project – Branches and applications of Civil Engineering.
Construction Materials: Properties and testing of building materials like Brick, Cement,
Concrete, RCC, Steel, Timber, Plastics - Classification of buildings according to National
Building Code

UNIT: 2

Construction of building components – foundations, brick, stone masonry, floors, beams,
lintels, slabs, roofs, doors and windows
Mechanical properties of materials: Tension, compression, Shear, stress, strain, various
modulii of elasticity E, N and K their relationship, Poisson’s ratio (no derivation), factor of
safety, compound, composite bars, - simple problems on applications

UNIT: 3

Water supply engineering – protected water supply, water quality, treatment and distribution
– sanitary engineering, terms, definitions, conveyance and treatment and disposal of sewage
Dams: selection of site, classification, types, components, uses Bridges: classification,
components

UNIT: 4

Surveying: Classification, Principles, Chain, Compass Surveys, Leveling-Simple problems –
Introduction to total station — Contours – Calculation of areas by Trapezoidal and Simpson’s
rule. Transportation Engineering: modes of transportation, classification of roads,
components, geometric parameters – construction of various types of roads. Traffic signs,
signals – railways – permanent way – comparison of roadway and railway – gauges,
components, points and crossings

Text Book:
1. Palanichamy. M.S, Basic Civil Engg., Tata Mcgraw Hill(P) Co Ltd., NewDelhi

References:
CREDITS: 02

1. Programs on arithmetic operators (like simple interest, compound interest and Celsius to Fahrenheit)
2. Programs on conditional and looping statements (like solving Quadratic equation, Sine and cosine series, Summation of digits)
3. Programs on Numerical Methods problems (like Runge-Kutta Method, Gauss-Seidal method)
4. Programs on arrays (like Matrix operations, finding minimum or maximum in a set of numbers)
5. Programs on string manipulations (palindrome, pattern searching)
6. Programs on Functions and recursion (factorial, Fibonacci, tower of Hanoi)
7. Programs on structure and unions (student, employee details)
8. Programs on pointers (sorting or searching)
9. Programs on files (payroll processing)
10. Menu driven Programs to demonstrate graphic functions (circle, line, ellipse arc)
11. Programs on Dynamic memory allocation
12. Programs on Command Line Arguments

CREDITS: 02

1. Introduction
2. Basic commands
3. Modifying commands
4. Editing commands
5. Changing Object Properties
6. Text and Dimensioning
7. Drawing Information
8. Orthographic and Isometric Drawing
1. Estimation of hardness of water by EDTA method
2. Estimation of COD of water
3. Estimation of sodium and calcium ions in water by flame photometry.
5. Estimation of chloride ion using potassium chromate indicator (Mohr’s method).
6. Determination of \( p^H \) of a solution and \( p^H \)-metric titration.
7. Preparation of polystyrene by free radical polymerization.
9. Determination of single electrode potential of the given electrode and Determination of emf of the given cell.
10. Determination of iron (II) using potentiometer (Radox titration)
11. Determination of equivalent conductance at infinite dilution for a strong electrolyte (NaCl)
12. Conductomeric titration of strong acid Vs strong base (Neutralization titration)
13. Conductomeric titration of silver nitrate Vs sodium chloride (Precipitation titration)
14. Determination of corrosion rate and inhibition efficiency of inhibitor for mild steel in hydrochloric acid medium.

(Any 12 experiments from the above list)
NUMBER OF PERIODS: 15  CREDIT: 01

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<td>Breaking the barriers</td>
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<td>Impromptu</td>
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<td>Creative Writing (Based on visual pictures)</td>
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<td>Word Game (checking vocabulary power)</td>
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<td>Ice Breaker (From Infosys Campus Connect)</td>
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<td>Role Play</td>
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<td>Letter Writing (Leave letter, Joining report, Acceptance to Offer)</td>
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<td>Public Speaking (Extempore speech)</td>
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OBJECTIVES

English II: Technical Communication focuses on developing proficiency of B.Tech. students in communication skills specific to their studies and likely demand in their workplace thereafter. Unit I introduces communication models where certain significant features like Courtesy, Body Language, Cultural differences can be gained indirectly by their participation in discussion, role play and presentation. Unit II introduces them to the full import of technical communication, Unit III to the special features of listening. Unit IV exposes the learner to the intricacies of speaking and Unit V to the special features of technical writing.

At the end of the course learners will be able to use English for all purposes of technical communication – make effective interpersonal interactions, make effective presentations and write various types of reports in appropriate format.

METHODOLOGY

Teachers will be guides on the sides, than sages on the stage. Students will learn the intricacies of technical communication through their active participation in pair/small group/large group discussions and seminar presentations.

EVALUATION

There will be no questions on theory. Students will do 10 assignments and three tests at the formative stage and one comprehensive summative examination of 3 hours at the end of the course. The formative and summative tests are designed to assess the outcome of the programme in terms of student performance.

Unit I: TEXTS
1. On Saying Please – A.G. Gardiner
2. Mr. Know All – Somerset Maugham
3. Notes on English Character – E.M. Forster
4. Science – Destroyer or Creator – J. Bronowski
5. The Technological Engine – Alvin Toffler
6. Dear Departed – Stanley Houghton
7. Hour of Truth – Percival Wilde

Unit II: Nature of Technical Communication
1. Definition, importance and process
2. 6cs of Communication
3. Maslow's hierarchy of needs, The ‘you’ attitude, Use of positive language, Confidence versus Sarcasm
4. Importance of Technical Communication
5. General and Technical Communication
6. Process of Communication
7. Levels of Communication – Interpersonal/Organizational/Mass
8. Flow of Communication – Downward/Upward/Horizontal

Unit III: Listening Comprehension (For internal assessment only)
1. Listening Process
2. Barriers to Listening
3. Types of Listening
4. Characteristics of a good listener
5. Listening and Note-taking
6. Training in Listening

**Unit IV: Professional Speaking** (For internal assessment only)
1. Audience Analysis
2. Organizing a speech
3. Delivering a speech: Presentation Strategies
4. Interview Techniques
5. Group Discussion

**Unit V: Professional Writing**
1. Trans-coding -- from verbal to visual & from visual to verbal
2. Editing, Proof reading, Referencing
3. Proposals
4. User manual and Product description
5. Reports – feasibility, market survey, project
6. Conference paper/journal article writing in IEEE Format
7. Memos and E-mails
8. Advertisement Writing

**Text Book**

**Books for Reference:**


NUMBER OF PERIODS: 60  CREDITS: 04

UNIT: 1  (15 Periods)

UNIT: 2  (15 Periods)

UNIT: 3  (15 Periods)

UNIT: 4  (15 Periods)
SEQUENCE AND SERIES: Introduction to Sequence and Series – Convergence and Divergence of Series (Real) – Series of positive terms – Comparison Test – Σ 1/n^p test – Cauchy’s Condensation Test – Cauchy’s Root Test – Ratio Test – RaBCH’s Test – Alternating Series – Leibnitz’s Test (only statement of Tests – no proof) Examples under the above tests - Problems

Text Book:

References:
NUMBER OF PERIODS: 60  CREDITS: 04

UNIT: 1  (15 Periods)

BASIC CONCEPTS OF OOPS: Characteristics of OOPS – Benefits of OOPS – Introduction to object oriented design and development – Design steps – Object oriented languages – comparison of C and C++. C++ program structure, data types, operators. Expressions, I/O functions, Type conversion control constructs, header files, arrays & string handling

UNIT: 2  (15 Periods)


UNIT: 3  (15 Periods)

VIRTUAL FUNCTIONS: Friend functions- generic programming with templates – Managing console I/O operations. Files & Streams, File pointers and their manipulations, Sequential and Random Access – Command line arguments

UNIT: 4  (15 Periods)

CLASSES: Exceptional Handling – List of exceptions – Catching and handling exceptions string class – Data class – Queue class – list class – Use defined classes

GRAPHICS: Text mode and graphic mode functions – Primitive drawing functions in C++ - Sound and motion – colors – text in graphic mode

Text Books:


References:

BEECPY 204/ BECCPY 204 / BEICPY 204/MPSCPY 204/MCSCPY 204/MICCPY 204:

ENGINEERING PHYSICS

NUMBER OF PERIODS: 60 CREDITS: 04

UNIT: 1 (15 Periods)
FIBER OPTICS – Light propagation in optical fibers – Types of optical fibers – Step Index and Graded Index – Single mode and Multimode fibers – Applications in Medicine(Endoscopes) and communication Systems(Block diagram only). Sensors – Fibre Optical sensors– Displacement sensors and Pressure sensors.

UNIT: 2 (15 Periods)

UNIT: 3 (15 Periods)
SUPER CONDUCTORS: Temperature dependence of resistance – Meissner’s effect – BCS theory – Type I and Type II super conductors – High temperature superconductors.

UNIT: 4 (15 Periods)

Text Book:

References:
BEECCE 205/ BECCCE 205/BEICCE 205/MPSCE 205 /MCSCCE 205/MICCE 205: ENVIRONMENTAL STUDIES

NUMBER OF PERIODS: 60 CREDITS: 04

UNIT: 1 (12 Periods)

INTRODUCTION: The Multidisciplinary nature of environmental studies: Definition, scope and importance - Need for public awareness

NATURAL RESOURCES: Renewable and non-renewable resources: Use And over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people - Water resources: utilization of surface and ground water, floods, drought, conflicts over water, dams – benefits and problems Mineral resources: Use and exploitation, environmental effects if extracting and using mineral resources, case studies- Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer – pesticide problems, water logging, salinity, case studies - Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, case studies - Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification - Role of an individual in conservation of natural resources - Equitable use of resources for sustainable lifestyles

UNIT: 2 (11 Periods)

ECO – SYSTEMS: Concept of an ecosystem - Structure and function of an ecosystem - Producers, consumers and decomposers - Energy flow in the ecosystem - Ecological succession - Food chains, food webs and ecological pyramids - Introduction, types, characteristic features, structure and function of the following ecosystem - Forest ecosystems - Grassland ecosystems- Desert ecosystems - Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

BIODIVERSITY AND ITS CONSERVATION: Introduction: Definition: genetic, species and ecosystem diversity - Biographical classification of India - Value of biodiversity: Consumptive use, productive use, social, ethical, aesthetic and option values - Biodiversity at global, national and local levels - India as a mega-diversity nation - Hotspots of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts - Endangered and endemic species of India - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

UNIT: 3 (11 Periods)

ENVIRONMENTAL POLLUTION: Definition - Causes, effects and control measures of - Air pollution - Water pollution - Marine pollution - Noise pollution - Nuclear hazards - Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution - Pollution case studies - Disaster Management: Floods, earthquakes, cyclones and landslides

UNIT: 4 (11 Periods)

SOCIAL ISSUES AND THE ENVIRONMENT: From unsustainable to sustainable development - Urban problems related to energy - Water conservation, rainwater harvesting, and watershed management

ENVIRONMENTAL ETHICS: Issues and possible solutions - Climate change, global warming, acid rain, and ozone layer depletion, nuclear accidents and holocaust. Case studies - Wasteland reclamation - Consumerism and waste products - Environment Protection Act -


**FIELD WORK:** A guided field visit to one of the following natural ecosystem. Visit to a local area to document environmental assets – river / forest / grassland / hill / mountain - Visit to a local polluted site – Urban / Rural / Industrial / Agricultural - Study of common plants, insects, birds - Study of simple ecosystems – pond, river, hill slopes, etc

**Text Books:**

1. “A Hand Book of Environmental Studies UG Course Material” – Compiled by Faculty of School of Civil Engineering, SASTRA.

**Reference:**

UNIT: 1

Definition of m.m.f, flux and reluctance – analysis of simple series (compound) magnetic circuits – problems- Leakage flux and Leakage coefficient 0 comparison between electric and magnetic circuits

UNIT: 2

Concept of three-phase emf generation – star & delta connections – relationship between line & phase values of voltages and current in a balanced system – power in three phase system

UNIT: 3


UNIT: 4

INTEGRATED CIRCUITS: Introduction to principles of ICs – IC fabrications of diode and BJT – linear ICs, Introduction to Operational Amplifiers – Ideal Op-Amp- DC & AC Characteristics, nonlinear ICs – introduction to logic gates- OR, AND, NOT, NOR & NAND gates.

Text Books:
2. Linear Integrated Circuits, Roy Chowdry & Shail Jain, new Age International (P) Ltd,2000

Reference:
ENGINEERING MECHANICS

NUMBER OF PERIODS: 60   CREDITS: 04

UNIT: 1

EQUILIBRIUM OF PARTICLES: Frames of reference- Force Systems – Resolution and addition of forces, resultant of several concurrent forces, Forces in 3D, Equations of equilibrium of particle in 2D and 3D - Lame’s theorem.

UNIT: 2


UNIT: 3


UNIT: 4

DYNAMICS OF PARTICLES: Displacement, velocity and acceleration and their relationship – rectilinear and curvilinear motion - rectangular components, Tangent and normal acceleration. Motion in a circular path- Newton’s law – Applications- Work energy principle- impulse and momentum principle- Applications

Text Books:

References:
1. Ferdinand.L.Singer, Engineering Mechanics (Statics and Dynamics), Harper Row Publishers
1. Write program in C++ to accept a single character from the keyboard. Display the character or keystroke and its decimal, hexadecimal, and octal values in the format: Character decimal hexadecimal octal.

2. Write a program to generate the following pyramid

```
  0
 1 0 1
2 1 0 1 2
```

3. Write a program to perform arithmetic operations (addition, subtraction, multiplication, and division) of two numbers using a pointer to a function.

4. Read a set of lines from stdin, store them in an array, and then read a string from stdin and check whether the given strings in the array are equal. Print the result to stdout.

5. Write a program to read a set of names, register numbers, DOB, and date of admission of the students where the dates consist of 3 members such as day, Month, and year as a separate structure. Sort them in ascending order using a structure data type.

6. Develop a program to create a data box with the following items using a structured data type: Name of the patient, sex, age, ward number, nature of illness, date of admission. The program should build a table. List the table. Insert entries, delete entries, edit an entry, and search for a record.

7. Write a program using classes and objects to read a set of lines and find out the number of characters, words, and lines in a given text.

8. Write a program to perform the salary details of the employees of a company using Constructor and destructor. The employee detail should include number, name, age, sex, basic salary, designation, and department. Calculate HRA, CCA, DA, TA, PF, and LIC according to basic salary. Display gross pay and net pay.

9. Write a program to perform simple operations of two complex numbers using operator overloading.

10. Write a program for finding the smallest and largest in a list of N numbers. Accept the value of N at runtime and allocate the necessary amount of storage for strong numbers.

11. Write a program to perform the following using function overloading:
   a. To read a set of integers.
   b. To read a set of floating point numbers.
   c. To read a set of double numbers.
   And find out the average of the non-negative numbers.

12. Design three classes: Student, Exam, and Result. The student class has data members such as Student number, name, etc. Create a class Exam by inheriting the student. The exam class adds data members representing the marks scored in 6 subjects. Derive the result from the exam class and its own data members such as total marks. Write an interactive program to model this relationship.
Safety Precautions to be followed in workshop

**CARPENTRY:** Study of Carpentry tools, Preparation of Cross Halving and Dove Tail Joint.

**SHEET METAL:** Study of sheet metal tools & equipments, Preparation of Cylinder & Tray.

**FOUNDRY:** Study of foundry tools, Preparation of green sand mould for cube & bend pipe patterns.

**FITTING:** Study of fitting tools, Preparation of square and angle fitting.

**WELDING:** Study of welding tools, equipments and power sources - preparation of Lap joint and Butt joint.

**SMITHY:** Study of smithy tools and equipments - Conversion of round rod to square rod

**BEECPY210/BECCPY210 /BEICPY 210/MPSCPY 210/MCSCPY 210/MICCPY 210**

**ENGINEERING PHYSICS LAB.**

**CREDITS: 02**

1. Determination of wavelength of Mercury Spectrum - Spectrometer Grating.
4. Determination of Thermal Conductivity of Bad Conductor - Lee’s Disc method
5. Study of NPN Transistor Characteristics – Common Emitter Configuration.
10. Thermistor- Variation of Resistance with Temperature.
11. Logic Gates- OR, AND, NOT, NOR, NAND using TTL ICs.
OUR CULTURAL HERITAGE

Dharma: Ethical Values- Truth- Non-violence.
Service – Sacrifice - Love – Universal Brotherhood
Honesty- Work Ethics- Duty – Tolerance
Swadharma- Self – knowledge – Self improvement.
The individual and Society
The Beautiful and the Good
Religion: Need – Universality – inter- religious understanding
Scientific Humanism

References:

1. Radhakrishnan, S - Indian Religion (Orient Paper Backs).
2. Jawaharlal Nehru – The Discovery of India : Chapters 3&4 – (OUP)
3. David Frawley- Hinduism; The Eternal Tradition; Chapter 1.6 (Voice of India, New Delhi)