Scheme of Study for I year B.Tech. / M.Tech. (5-Year Integrated) Programmes for the students to be admitted from 2011-12 onwards

SEMESTER-I
Common to BCE/BME/BMT/BCS/BIT/BCH/MST/MCM/MAM/MAU/MCH/BEE/BEI/BIC/B BT/BBE/BBI/MPS/MCS/MIC/MNN/MBI/MBT

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<th>Sl.No</th>
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<th>Period Per week</th>
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## SEMESTER-II

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CEN101/101R01/101R02
STRATEGIES IN COMMUNICATION

L T P C
2 1 - 3
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
   1. Concord – Subject -Verb; Noun - Pronoun
   2. Appropriate Verb Forms: aspects, questions and negatives, active-passive
   3. Use of Modal Auxiliaries
   4. Disambiguating words/phrases/sentences
   5. Tightening the rambling sentences with regard to simplicity, clarity and precision
   6. Indianisms – Words, Sentence patterns
   7. 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 Publication

Reference Books:


Course Objectives:
1. To acquire skills in using Trigonometric functions in applications.
2. To acquire mathematical skills in solving higher degree equations, locating roots, transforming equations from one domain to the other.
3. To appreciate mathematical construction of evolutes and envelopes in engineering courses like Mechanics and Engineering Drawing.
4. To understand how functions of several variables constitute engineering optimisation.
5. To comprehend the involvement of improper and multiple integrals in engineering problems with notations and tables.
6. To evaluate multiple integrals that occur frequently in engineering problems. At the end of the course, students will be confident to apply various mathematical concepts to engineering science.

UNIT I: 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 II: Theory of equations & Algebra


Algebra: Binomial, Exponential and Logarithmic Series(without proof) -- Problems on summation, coefficient and approximations.
UNIT – III : Differential Calculus & Functions of several variables 15 PERIODS


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 – IV: Improper and Multiple Integrals 15 PERIODS

Improper Integrals: Concept of improper integrals with examples – Definition of Beta and Gamma integrals – Relation 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).

Multiple Integrals: Double Integrals – Evaluations – Change of order of integration – Triple integrals(problems involving Jacobians are not included) – Simple applications.

Text Book:


Reference Books:


CCS103/103R01
Programming in C

L  T  P  C
3  1  0  4

Objective:
• To understand the designs of programming
• To develop the problem solving skills
• To be able to develop a C Program for a given problem

Unit I  15 Periods


Unit II  15 Periods

Working with Arrays: Defining an Array, Initializing Arrays, Character Arrays, Multidimensional Arrays, Variable-Length Arrays. Working with Functions: Defining a Function, Arguments and Local Variables, Returning Function Results, Functions Calling Functions, Functions and Arrays, Global Variables, Automatic and Static Variables, Recursive Functions. Applications of Arrays and Functions: removal of duplicates from an ordered array, partitioning an array, sorting by diminishing increment, binary search, keyword searching in a text, stack operation, computing the prime factors of an integer.

Unit III  15 Periods

Constant Strings, Character Strings, Structures, and Arrays, Character Operations. **Pointers:** Defining a Pointer Variable, Using Pointers in Expressions, Working with Pointers and Structures, The Keyword const and Pointers, Pointers and Functions, Pointers and Arrays, Operations on Pointers. **Operations on Bits:** Bit Operators, Bit Fields. **The Preprocessor:** The #define Statement, The #include Statement, Conditional Compilation. **More on Data Types:** Enumerated Data Types, The typedef Statement, Data Type Conversions. **Applications of structures, character strings and pointers:** Left and right justification of text, text line editing, linked list search, linked list insertion and deletion.

**Unit IV**

**15 Periods**

**Working with Larger Programs:** Dividing a Program into Multiple Files, Communication between Modules, Other Utilities for Working with Larger Programs. **Input and Output Operations in C:** Character I/O: getchar and putchar, Formatted I/O: printf and scanf, Input and Output Operations with Files, Special Functions for Working with Files. **Miscellaneous and Advanced Features:** Miscellaneous Language Statements, Working with Unions, The Comma Operator, Type Qualifiers, Command-Line Arguments, and Dynamic Memory Allocation. **Debugging Programs:** Debugging with the Preprocessor, Debugging Programs with gdb. **Application of file I/O:** creation and processing of text and binary files with and without command line arguments.

**Text Books:**

**Reference Books:**
UNIT I: QUANTUM PHYSICS 15 PERIODS

UNIT II: SEMICONDUCTING AND NANO MATERIALS 15 PERIODS
Electrical and Thermal Conductivity of Metals - Types of Semiconductor - Charge Carrier Density in Intrinsic Semiconductors – Doping of Semiconductors – Carrier Densities in Doped Semiconductors – Fermi Dirac Formalism – Conductivity of Semiconductors – Hall effect – Experimental Determination of Carrier Concentration and Mobility


UNIT III: INTRODUCTION TO SPECTROSCOPY 15 PERIODS


UNIT IV: LASER AND MICROSCOPES  15 PERIODS


Text Books


Reference books


CCE105R01 /CCE205/205R01

ENGINEERING MECHANICS

Unit – I Equilibrium of Particles  15 Periods
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 – II Equilibrium of Rigid Bodies  15 Periods

Unit – III Friction  15 Periods

Unit – IV Dynamics of Particles  15 Periods
Text Books

Reference Books
UNIT I: Civil Engineering Materials 8 Periods
Branches of Civil Engineering – Civil Engineering materials – stones, Bricks, Steel, Cement, Concrete, Timber and plastics – different types.

UNIT II: Surveying 7 periods

UNIT III: Building components 8 Periods

UNIT IV: Mechanics and structures 7 periods

Text Book:

Reference Books
CME107/ CME207
BASIC MECHANICAL ENGINEERING
L T P C
2 0 0 2
UNIT I: Energy Resources and Power Plants

Conventional and non-conventional energy resources – applications
Power plants – steam, hydel, nuclear, gas turbine, combined cycles.
Steam Boilers - modern high pressure boilers. Steam turbines - types operating principle.

Refrigeration and Air-conditioning – principles of operation of refrigerator and
air-conditioner.

I.C. Engines-types – working principles of 2-stroke and 4-stroke engines – fuel
injection systems – ignition systems – cooling and lubrication systems.

UNIT II: Manufacturing Technology

Machining – Operations in lathe, drilling and shaping, introduction to CNC
machining. Forming – principles of forging – rolling – extrusion – sheet metal forming
types.

Text Book:

1. K. Venugopal and V. Prabu Raja, Basic Mechanical Engineering,
   Anuradha

Reference Books

1. T.J.Prabhu, V.Jaiganesh and S. Jebaraj, Basic Mechanical
   House
1. Programs using Input, output and assignment statements
2. Programs using Branching statements
3. Programs using Looping statements
4. Programs using Functions
5. Programs using Arrays
6. Programs using Structures
7. Programs using strings
8. Programs using Pointers (both data pointers and function pointers)
9. Programs using dynamic memory allocation
10. Programs using Recursion
11. Programs using Files
12. Dividing a large program into multiple files
List of Experiments
(Any 12 experiments)

1. Four probe method – Measurement of Resistivity of material.
4. Logic gates AND, OR, NOT, NAND and NOR construction and truth table verification using discrete components.
5. Spectrometer – Determination of wavelength by using diffraction grating
8. Transistor Characteristics - Common Emitter Configuration.
13. Thermistor - Variation of Resistance with Temperature and find the Energy gap.
List of Exercises

1. Angle Fitting by filing of Steel flats
2. Fabrication of a Tray from G. I sheet
3. Forging of round rod to square Rod
4. Welding of Lap and Butt joints
5. Preparation of Mould cavity
6. (a) Dismantling, study and assembly of I.C. Engines
   (b) Dismantling, study and assembly automobile gearbox
7. Study of power distribution and domestic electric appliances
   (a) Power distribution setup
   (b) Measure of insulation using megger
   (c) Efficiency of electric kettle
8. Study of domestic wiring
   (a) Staircase wiring
   (b) Fluorescent lamp wiring
   (c) Ceiling fan wiring
9. Design of regulated power supply and demonstration of its working
10. (a) Measurement of passive components R, L & C using bridges
    (b) Measurement of amplitude, frequency and phase angle of standard waveforms using Cathode Ray Oscilloscope (CRO)

11. Study & Testing of PC Hardware

12. Setting various bonds using bricks

13. Pipe fittings and fixtures in field
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

Reference Books:

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)
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. 6c s 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
Technical Communication. SASTRA Publication.

Reference Books:


CMA202/202R01

ENGINEERING MATHEMATICS II
(COMMON FOR ALL BRANCHES)

L T P C
3 1 0 4
Course Objectives:

1. To recognize differential equations arising from science/engineering problems and develop methods to solve it.
2. To represent data in matrix form; to interpret eigen values of matrices physically and geometrically; to program various matrix operations.
3. Computations of various Vector Calculus operations
   - To physically interpret vector operators and to solve problems.
   - To evaluate multiple integrals that occur frequently in physical and engineering problems.
4. To interpret Mathematically various three-dimensional surfaces by equations which forms the basis for Computer Graphics.
   At the end of the course, students will have skills in mathematically modeling practical problems and solving them.

UNIT I - Ordinary Differential Equations

PERIODS

First order first degree ODEs - Bernoulli’s Differential equation – Exact ODEs

UNIT II - Matrix Algebra

PERIODS

Introduction – Inverse of a matrix by elementary transformation – Linear independence and dependence of vectors – Eigen values and Eigen vectors – properties of Eigen values and Eigen vectors with proofs – Cayley Hamilton theorem(without proof)
UNIT III - VECTOR CALCULUS


UNIT IV - ANALYTICAL GEOMETRY OF THREE DIMENSIONS


Text Book:


Reference Books:

Objective:
• To understand the concepts of OOP
• To apply OOP in solving problems
• To develop a C++ program for a given problem.

Unit I
15 Periods


Unit II
15 Periods

Object And Classes: Implementation of Class in C++, C++ Objects As Physical Object, C++ Object As Data Types, Constructor, Object As Function Arguments, the Default Copy Constructor, returning Object From Function, Structures And Classes, Classes Objects And Memory Static Class Data, Const Data and Classes. Arrays and String Arrays Fundamentals: Arrays as Class Member Data, Arrays Of Object, String, the standard C++ String Class. Operator Overloading: Overloading Unary Operators, Overloading of Binary Operators, Data Conversion, Pitfalls of Operators Overloading And Conversion, Keywords Explicit And Mutable.

Unit III
15 Periods

Inheritance: Concept of Inheritance, Derived Class And Base Class, Derived Class Constructors, Overriding Member Function, Inheritance In The English Distance Class, Class Hierarchies, Inheritance And Graphics Shapes, Public And Private Inheritance, Levels Of Inheritance, Multiple Inheritance, Ambiguity In Multiply Inheritance, Aggregation: Classes Within Classes, Inheritance And program Development. Pointers: Addresses and pointer, The Address-Of Operator &, Pointer and Arrays, Pointer and Fraction, Pointer And C- Types String. Memory Management: New And Delete, Pointers to Objects, Debugging pointers. Virtual Function: Virtual
Function, Friend Function, Static Function, Assignment And Copy Initialization, This Pointer, Dynamic Type Information.

Unit IV  15 Periods


Text Book


Reference Books


UNIT I: 15 Periods
WATER TREATMENT: Hardness of water, Complexometric determination of hardness of water – EDTA method, Problems on hardness calculation; Specifications for boiler feed water, Boiler problems – Scales and sludges, Boiler corrosion, Caustic embrittlement, Priming & foaming; Various internal treatment procedures of boiler water; External treatment methods – Lime–Soda process, Zeolite process, Ion exchange process; Specifications for drinking water, Treatment of water for domestic use; Desalination of brackish water – Electro dialysis, Reverse osmosis; Waste water treatment – Aeration, Trickling filter, Activated sludge process.

UNIT II: 15 Periods
HIGH POLYMERS: Monomers and their functionality, Nomenclature of polymers, Classification of polymers; Types of polymerization – Chain (addition) and step-growth (condensation) polymerization; Plastics, Compounding of plastics; Fabrication techniques – Compression, injection and transfer molding; Preparation and uses of some thermoplastic (Rosin. Shellac, Cellulose derivatives, Vinyl resins, Polyamides – Nylons and Kevlar) and thermosetting (Phenoplasts, Amino resins, Polyester resins, Alkyd resins, Epoxy resins, Polyurethanes, Silicones) resins; Structure – property relationship in polymers- Physical state- Chemical resistance and strength of polymers; Foamed, Reinforced and Conducting polymers.

UNIT III: 12 Periods
CORROSION & CORROSION CONTROL: Electrode potentials and Electrochemical series, Galvanic cells and Electrolytic cells, Chemical and Electrochemical corrosion, Factors influencing corrosion, Mechanism of rusting of iron in acid neutral and alkaline environments, Differential metal corrosion, Differential aeration, Atmospheric and soil corrosion. Anodic and cathodic protection, Electroplating, Electroless plating,
Anodization, Corrosion inhibitors, Importance of selection of materials and design of structural patterns in corrosion control.

UNIT IV 18 Periods

ENGINEERING MATERIALS: Superconductors – Superconductivity and temperature, Types of superconductors, Superconducting cuprates, Applications of superconductors (superconducting magnets, catalysis, gas sensors, electronic components); Lubricants – Role of a lubricant, Classification of lubricants (Synthetic lubricants, Liquid lubricants, Semi-solid and Solid lubricants), Viscosity index, Cloud point, Pour point, Flash point; Anti-stiction agents for Micro Electromechanical Systems (MEMS); Plating on plastics for printed circuit boards.

NANOMATERIALS: Definition of nanomaterials, Surface-to-Volume ratio, Types of nanomaterials (metal, semiconductor, polymer nanomaterials; quantum dots, nano films and nanowires), Size and shape - dependent optical, electrical, thermal and mechanical properties; Applications of nanomaterials (examples in health care, electronics and textile industry).

Textbook:


Reference Books:


Unit –I: Basics of Engineering drawing and Curves  
15 Periods


Unit–II: Projection of points, lines and Solids  
15 Periods

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–III: Section of solids and Development of lateral surfaces  
15 Periods

Section of solids- true shape of sections – development of lateral surfaces of solids-prisms, pyramids, cylinders and cones.

Unit–IV: Isometric projection and building drawing  
15 Periods

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

Text Books


Reference Books

UNIT I: 15 PERIODS

**DC circuits:** Definition and units of voltage, current, potential difference, power, energy, resistance, conductance, resistivity- Ohm’s law-Kirchhoff’s law-series circuits-parallel circuits-series parallel circuits-simple problems on Ohm’s law and series parallel circuits- Mesh and Nodal analysis-simple problems.

**AC fundamentals:** Concepts of ac-Definition of terms, cycle, frequency, time period, amplitude, instantaneous value, average value, rms value, maximum value, form factor and peak factor.

**Magnetic circuits**
Definition of magneto motive force (m.m.f), flux and reluctance-analysis of simple series (compound) magnetic circuits-problems. Leakage coefficient- comparison between electric and magnetic circuits. Faraday’s law of electromagnetic induction-Lenz’s law-statically and dynamically induced e.m.f-self and mutually inductances-energy stored in the magnetic field of an inductor-force on a current carrying element in a magnetic field-Fleming right and left hand rules-simple problems.

UNIT II: 10 PERIODS

**Basic Electronic Devices:** Semi conductor P-N junction diode- working principle-V-I characteristics, zener diode -zener breakdown-V-I characteristics, Bipolar junction transistor- Modes of operation-input, output characteristics, Junction Field Effect transistor- working principle- drain and transfer characteristics, Special diodes- varactor diode, Photo diode, Schottky diode, tunnel diode

UNIT III: 10 PERIODS

**Unit and systems**- Basic Need for measurement of physical quantities, units for measurement, systems of units-SI: fundamental and derived units.

**Measurement of Parameters:** Different methods of measuring low, medium and high resistances, measurement of inductance & capacitance with the help of AC Bridges, Q Meter.

**Cathode Ray Oscilloscope:** Basic CRO circuit (Block Diagram), Cathode ray tube (CRT) & its components, application of CRO in measurement, Measurement of phase difference and frequency of a sinusoidal ac voltage, Lissajous Pattern, Dual Trace & Dual Beam Oscilloscopes.
UNIT IV:  

10 PERIODS

Communication: Signals- analog and digital, need for modulation-amplitude modulation, Frequency modulation-Phase modulation - pulse modulation techniques- Digital modulation- ASK, FSK, PSK MODEM

(Block diagram approach): Radio, TV, Picture tube- television camera and scanning- TV signal transmission- micro wave system- satellite communication - fibre optic communication- ISDN

Reference Books:

1. B.L.Theraja, Fundamentals of Electrical and Electronics Engineering, S.Chand & Co., New Delhi, 1997
UNIT I: Natural Resources

Renewable and non-renewable resources – Associated problems – Forest Resources – mineral resources – water resources - Food resources - Energy resources(Renewable and non-renewable) - Land resources - Role of intellectuals in conservation of natural resources.

UNIT II: Eco-systems


UNIT III: Pollution


UNIT IV: Human Population and the Environment


Field Work: 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 University, 2004.

Reference Books:
2. Bharucha Erach, Textbook of Environmental Studies for Undergraduate Courses, University Press, 2009
CCS208/208R01
Programming in C++ Lab

1. Programs using branching
2. Programs using multidimensional arrays
3. Programs using function overloading, inline functions
4. Programs using classes and objects (array as data members, array objects)
5. Programs using constructors and destructors
6. Programs using String class
7. Programs using operator overloading
8. Programs for data conversion using overloading
9. Programs using inheritance
10. Programs using virtual functions, friend functions
11. Programs using templates
12. Programs using files
13. Dividing a large program into multiple files
1. Determination of total hardness of water by EDTA method.
2. Estimation of Chemical Oxygen Demand (COD) in wastewater.
3. Estimation of sodium and calcium ions in water by flame photometry.
4. Estimation of iron (II) using diphenylamine indicator (Dichrometry – Internal indicator method).
5. Estimation of chloride ion using potassium chromate indicator (Mohr’s method)
6. Determination of pH of a solution and pH metric titration.
7. Preparation of polystyrene by free radical polymerization.
10. Determination of iron (II) using potentiometer (Redox titration).
11. Determination of equivalent conductance at infinite dilution for a strong electrolyte (NaCl).
12. Conductometric titration of strong acid Vs strong base (Neutralization titration).
13. Conductometric titration of barium chloride Vs sodium sulphate (Precipitation titration).

(Any 12 experiments from the above list)
List of Exercises using AutoCAD Software

1. Introduction to AutoCAD
2. Basic commands of AutoCAD
3. Modifying commands
4. Editing commands
5. Changing Object Properties
6. Text and Dimensioning
7. Drawing Information
8. Orthographic and Isometric Drawing
9. 3-D Drawing
10. 3-D Model - Wire frame model, Surface model, Solid Model

Text Books:

Reference Books: