UG CURRICULUM AND SYLLABI

SEMESTER II
CURRICULUM

SEMESTER II

B.Tech (CSE/ECE/IT)
## CURRICULUM

**SEMESTER II (15 weeks)**

<table>
<thead>
<tr>
<th>SL. NO</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
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<td>1.</td>
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<td>Complex Analysis and Transforms</td>
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**TOTAL CREDITS**

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SYLLABI

SEMESTER II

B.Tech (CSE/ECE/IT)

Complex Analysis: Contour integrals - Cauchy Integral Formula -Taylor’s and Laurent’s expansions - Zeros and singularities of an analytic function - Residues - Residue theorem - Evaluation of definite integrals.


Text Books


References


Dielectrics, Ferroelectrics and Piezoelectrics: Microscopic concept of Polarisation—Langevin’s Theory of Polarisation in polar dielectrics- Internal field – Claussius - Mosotti equation - Debye’s equation- Lorentz-Lorentz formula –Static dielectric constants of solids and liquids - Complex dielectric constant and dielectric loss-dielectric breakdown-Absorption of energy and dielectric loss-Effects of dielectrics-Ferroelectricity-Piezoelectricity.


Text Books

References


Text Books

References
List of Experiments:

1. Verification of Ohm’s Law, Kirchoff’s Law
3. Thevenin's and Norton's Equivalent Circuits
4. DC Circuits (Equivalent Resistance and Series / Parallel Resistance Circuits)
5. Nodal and Mesh Analysis
6. PN junction diode Characteristics
7. Zener diode Characteristics
8. Transistor CE Characteristics
9. Rectifier without filters
10. UJT Characteristics
11. FET Characteristics
12. CE Amplifier, Class A Amplifier
13. RC Phase Shift Oscillator


Text Books


References


**Text Book**


**References**

CSPC21 - DISCRETE STRUCTURES


Algebraic Structures: Algebraic Systems: Examples and General Properties-Semi groups and Monoids: Homomorphism of semi groups and Monoids, Sub-Semigroups and Sub-Monoids -Grammars and Languages: Discussion of Grammars, Formal Definition of Language, Notions of Syntax Analysis-Polish Expressions and their Compilation: Polish Notation, Conversion of Infix Expressions to Polish Notation.

Groups and Lattices: Groups, Subgroups and Homomorphism, Cosets and Lagrange's Theorem, Normal Subgroups, Algebraic Systems with Two Binary Operations -The application of residue Arithmetic to computers-Group Codes: The Communication Model and Basic Notions of Error Correction, Generation of Codes by Using Parity Checks, Error Recovery in Group Codes-Lattices as Partially Ordered Sets: Properties of Lattices, Lattices as Algebraic system, Sub lattices, Direct Product, and Homomorphism-Overview of Boolean Algebra.


Text Book

References


DC Machines: Construction of DC Machines – Theory of operation of DC generators – Characteristics of DC generators- Operating principle of DC motors – Types of DC motors and their characteristics– Speed control of DC motors- Applications.


Text Books

References
List of Experiments:

1. Periodic Waveforms, Average and RMS Values
2. Periodic Waveforms and Harmonics
3. Verification of Ohm's law, Kirchoff’s Law
5. DC Circuits (Equivalent Resistance and Series / Parallel Resistance Circuits)
6. Nodal and Mesh Analysis
7. Verification of principle of superposition with DC and AC sources
8. Verification of Thevenin, Norton and Maximum power transfer theorems in AC circuits
9. Voltage generation characteristics of a DC Generator
10. Speed-load control characteristics of a DC Motor
11. Performance of single phase Induction Motor
12. Performance Characteristics of 3-Phase Induction Motor
13. Characteristics of Synchronous Motors


Templates and Exceptions: Function and Class templates - Exception handling.


Text Books


References

8. STL Programs Web Link:  
   http://www.tenouk.com/cpluspluscodesnippet/cplusstandardtemplatelibrarystlsindex.html
List of Experiments

1. a) Develop a C++ program using classes and member functions to accept a paragraph, print each word in the paragraph with the number of vowels in each word.
   b) A company produces pens. Three salesmen of the company are selling the pens in four different districts. Develop a C++ program using classes and member functions to read the quantity sold by each salesman in different districts and display the quantity sold by each sales man with district and the total quantity sold.
   c) Develop a C++ program using classes and member functions to perform the arithmetic operations on matrices.
2. Design C++ classes with static members, methods with default arguments, friend functions. (For example, design matrix and vector classes with static allocation, and a friend function to do matrix-vector multiplication)
3. Implement complex number class with necessary operator overloading and type conversions such as integer to complex, double to complex, complex to double etc.
4. Write a C++ program to perform the string concatenation using dynamic memory allocation.
5. Implement Matrix class with dynamic memory allocation and necessary methods. Give proper constructor, destructor, copy constructor, and overloading of Assignment operator overloads the new and deletes operators to provide custom dynamic allocation of memory.
6. Develop templates of standard sorting algorithms such as bubble sort, insertion sort.
7. Exception handling - Divide by Zero, arrays out of bounds, memory exhaustion exception
   a) Insertion and selection sort on (i) integer array (ii) strings
   b) Linear Search and Binary search over (i) integer array (ii) strings
8. a) Define Point class and an Arc class. Define a Graph class which represents graph as a collection of Point objects and Arc objects. Write a method to find a minimum cost spanning tree in a graph.
   b) Write a C++ program with two classes named as “one”, “two” to find the area of square and rectangle respectively, and inherit these values to another class named as “cuboid” with its own property “height” to find the area of the cuboid.
9. Develop with suitable hierarchy, classes for Point, Shape, Rectangle, Square, Circle, Ellipse, Triangle, Polygon, etc. Design a simple test application to demonstrate dynamic polymorphism and RTTI.
10. Write a C++ program that randomly generates complex numbers (use previously designed Complex class) and writes them two per line in a file along with an operator (+, -, *, or /). The numbers are written to file in the format (a + ib). Write another program to read one line at a time from this file, perform the corresponding operation on the two complex numbers read, and write the result to another file (one per line).
11. a) Develop a simple C++ vector container program.
    b) Implement C++ STL vector using various operators code.
    c) Implement C++ STL vector using constructors.
EGIR11 - ENGINEERING GRAPHICS


Projection of Points, Lines and Plane Surfaces: First angle projection-Projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and trapezoidal method and traces Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

Projection of Solids and Section of Solids: Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes by rotating object method and auxiliary plane method - Section of solids - True shape of section.


Isometric and Perspective Projections: Principles of isometric projection – isometric scale –Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- Perspective projection of prisms, pyramids and cylinders by visual ray method.

Text Books


References

Environment, Ecosystems and Biodiversity: The multidisciplinary nature of environmental studies, definition, scope and importance - need for public awareness - concept of an ecosystem - structure and function of an ecosystem - 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: (a) Forest ecosystem. (b) Grassland ecosystem. (c) Desert ecosystem. (d) Aquatic ecosystems - introduction to biodiversity – definition: genetic, species and ecosystem diversity - value of biodiversity - biodiversity at global, national and local levels - hot-spots of biodiversity. Environmental hydrology and hydraulic principles. Field study of local area to document environmental assets - river/ forest/ grassland/ hill/mountain. Field study of common plants, insects, birds. Field study of simple ecosystems - pond, river, hill slopes, etc.

Environment Pollution and Pollution Abatement: Types of pollution - definition and consequences - air pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, nuclear hazards - adsorption - types - adsorption of solutes from solutions - role of adsorbents - activated carbon in pollution abatement of air and waste water - Advanced oxidation process (AOPs) to remove organic pollutants in waste water - principles and advantages - solid and hazardous waste management: causes, effects and control measures of municipal solid wastes - role of an individual in prevention of pollution. Recent trends in environmental science and pollution control. Role of Information and Communications Technology (ICT) for monitoring and controlling of environmental pollution at global, national and local levels. Field study of local polluted site - urban/rural/industrial/agricultural and preparation of report


Principles of Sampling and Analysis of Pollutants: Purpose of sampling, different types of samples - water, waste water, soil and air - collection methods - preserving samples - gaseous pollutant monitoring - analytical methods like spectroscopic and chromatographic techniques used for analysis of samples. Case studies of analysis of pollutants by government and private organization. Visit to an analytical lab and or air pollution treatment facility.

Text Books

2. Erach Bharucha, Environmental Studies for Undergraduate Courses, UGC, New Delhi and Bharati Vidyapeeth Institute of Environmental and Research, Pune, 2004.

References


Field Work:

(a) Visit to a local area to document environmental assets – river/ forest/ grassland/ hill/ mountain.
(b) Visit to a local polluted site-Urban/ Rural/ Industrial/ Agricultural.
(c) Study of common plants, insects, birds.
(d) Study of simple ecosystems – pond, river, hill slopes, etc.
Communication Skills - An Overview: Defining communication - Need for effective communicational skills - Nature of communication in social and professional setups - Process of communication - Communication nuances - Barriers to effective communication - Tips to overcome communication barriers.

Listening Skills: Listening versus hearing - Listening process - General versus Academic listening - Importance of Academic listening - Types of Academic listening (Active listening - Attentive listening - Biased listening - Comprehension listening - Critical listening - Discriminative listening - Informational listening - Selective listening - Therapeutic/ Empathetic listening) - Barriers to effective academic listening (Psychological and Physical) - Techniques and strategies to become an effective academic listener.

Speaking Skills: Importance of effective speaking skills - Principles of effective speaking - General speech versus Academic speech - Types of Speeches (Actuate - Conversational - Informative - Persuasive - Interactive - Partially interactive - non-interactive - Negotiation) - Barriers to effective speaking - Tips to become an effective speaker.

Reading Skills: Definition and benefits of reading - General reading versus Academic reading - Process of reading - Types of Academic reading (Intensive reading - Narrow reading - Informational reading - Critical reading - Analytical reading - Close reading) - Benefits of academic reading - Barriers to academic reading - Tips to become an effective reader.

Writing Skills: Characteristics of a good writer - Introduction to academic writing - General writing versus Academic writing - The writing process - Types of Academic writing (Expository writing - Persuasive Writing - Descriptive writing - Narrative writing - Instruction writing - Writing to compare and contrast - Analytical and critical writing - Definition writing - Summary writing - Developing hints - Business / Project proposal writing) - Barriers to effective academic writing - Tips to improve academic writing.

Text Books

References
4. Eric Palmer, Teaching the core skills of listening and speaking, ASCD (Association for Supervision and Curriculum Development), 2014.
The professional courses consist of the guest lectures and special lectures given by various eminent experts from well reputed institutions, industries and R&D laboratories. The potential topics covered are state of the art technologies, recent trends in industry and evolving research arena.