

# CENTRAL UNIVERSITY OF KASHMIR

Tulmulla, Ganderbal, Jammu and Kashmir, 191131



## **Bachelors in Technology (B. Tech)** **Computer Science & Engineering (CS&E)**

COURSE STRUCTURE AICTE and NEP-2020

[BoS 16/04/2026]

For 2026 Batch

**School of Engineering & Technology**

Department of Information Technology

| Semester I |             |                                                                     |   |   |   |              |     |     |
|------------|-------------|---------------------------------------------------------------------|---|---|---|--------------|-----|-----|
| S.NO.      | Course Code | Course Title                                                        | L | T | P | Total Credit | CIA | ESE |
| 1.         | TAA.11.101  | Computer Fundamentals and Applications.                             | 3 | 0 | 0 | 3            | 50  | 50  |
| 2.         | TAA.13.101  | Basic Electrical Engineering / (MDC)                                | 3 | 0 | 1 | 4            | 50  | 50  |
| 3.         | TAA.15.101  | Engineering Drawing / (SEC)                                         | 2 | 0 | 0 | 2            | 50  | 50  |
| 4.         | GDA.13.101  | Discrete Mathematics /(MDC)                                         | 3 | 0 | 0 | 3            | 50  | 50  |
| 5.         | GDB.12.102  | Engineering Physics                                                 | 3 | 0 | 1 | 4            | 50  | 50  |
| 6.         |             | IKS-I (Sociology & Elements of Modern Indian History for Engineers) | 2 | 0 | 0 | 2            | 50  | 50  |
| 7.         |             | AEC-I (Soft Skills / English)                                       | 2 | 0 | 0 | 2            | 50  | 50  |
| 8.         |             | Induction / (Clubs/Intxns)                                          | 0 | 0 | 0 |              |     |     |
|            |             | <b>Total</b>                                                        |   |   |   | <b>20</b>    |     |     |

|                       |                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                             |                                         |         |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|---------|
| Programme:            | B.Tech. CSE                                                                                                                                                                                                                                                                                                                                               | Semester:                                                                                                                                                                                                                                                                                                                                   | I                                       |         |
| Course Code:          | TAA.11.101                                                                                                                                                                                                                                                                                                                                                | Course Title:                                                                                                                                                                                                                                                                                                                               | Computer Fundamentals and Applications. |         |
| Scheme of Instruction |                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                             | Scheme of Evaluation                    |         |
| Total Duration        | 60 Hrs.                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                             | Max. Marks                              | 100     |
| Hours/Week            | 3 Hrs.                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                             | Assignment/IA                           | 45      |
| Credits               | 3                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                             | Attendance                              | 05      |
| Instruction Delivery  | L:3, T:0, P:0                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                             | End Semester Exam                       | 50      |
| Course Basket         | Major                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                             | Exam Duration                           | 2.5 Hr. |
| Instruction Mode      | Regular                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                             | Evaluation                              | Grade   |
| Course Objectives     | 1. To understand the fundamental concepts of computer systems and their components.<br>2. To develop problem-solving skills using algorithms and flowcharts.<br>3. To gain knowledge of operating systems and Linux environment.<br>4. To develop practical skills in office automation tools.<br>5. To understand the role of IT in modern applications. |                                                                                                                                                                                                                                                                                                                                             |                                         |         |
| Course Outcomes       | CO1: Explain the architecture and functioning of computer systems.<br>CO2: Design algorithms and flowcharts for simple problems.<br>CO3: Understand operating systems and basic Linux commands.<br>CO4: Use MS Office tools efficiently for documentation and data handling.<br>CO5: Analyze the application of computing tools in real-world scenarios.  |                                                                                                                                                                                                                                                                                                                                             |                                         |         |
| Content               |                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                             |                                         |         |
| Unit 1                | Module 1                                                                                                                                                                                                                                                                                                                                                  | Basics of Computers:<br>Definition of computers, characteristics such as speed, accuracy, diligence, versatility and automation. Applications of computers in various fields like education, business, healthcare and communication. Overview of computer system components and their interaction.                                          |                                         |         |
|                       | Module 2                                                                                                                                                                                                                                                                                                                                                  | Input, Output and Storage Devices:<br>Detailed study of input devices such as keyboard, mouse, scanner, light pen, joystick. Output devices including monitor, printer, plotter, speakers. Storage devices: primary storage (RAM, ROM) and secondary storage (hard disk, CD/DVD, USB drives). Comparison of different storage technologies. |                                         |         |
|                       | Module 3                                                                                                                                                                                                                                                                                                                                                  | Central Processing Unit (CPU):<br>Structure of CPU including ALU, CU and registers. Functions of CPU and                                                                                                                                                                                                                                    |                                         |         |

|               |                 |                                                                                                                                                                                                                                                                                                                                    |
|---------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               |                 | instruction cycle. Concepts of processor speed, clock rate, cache memory and performance factors. Overview of internal architecture and data processing.                                                                                                                                                                           |
|               | <b>Module 4</b> | <b>Number System and Data Representation:</b><br>Number systems: binary, decimal, octal and hexadecimal (basic idea).<br>Conversion techniques between binary and decimal systems.<br>Representation of data in computers. Character encoding schemes such as ASCII and Unicode.                                                   |
|               | <b>Module 5</b> | <b>Memory and Software Concepts:</b><br>Types of memory: RAM, ROM, cache memory and their characteristics.<br>Booting process (cold and warm booting). Secondary storage devices and technologies. Classification of software into system software and application software. Introduction to compilers and basic system utilities. |
| <b>Unit 2</b> | <b>Module 1</b> | <b>Introduction to Algorithms:</b><br>Definition of algorithms, characteristics such as finiteness, definiteness and effectiveness. Properties of a good algorithm. Role of algorithms in problem solving and programming.                                                                                                         |
|               | <b>Module 2</b> | <b>Algorithm Design and Examples:</b><br>Steps involved in designing algorithms. Writing algorithms for basic problems such as addition, searching, and sorting (conceptual).<br>Representation using pseudocode.                                                                                                                  |
|               | <b>Module 3</b> | <b>Flowcharts Basics:</b><br>Introduction to flowcharts, commonly used symbols (terminator, process, decision, input/output). Meaning and importance of flowcharts in problem solving.                                                                                                                                             |
|               | <b>Module 4</b> | <b>Flowchart Design and Examples:</b><br>Guidelines for drawing flowcharts. Developing flowcharts for simple problems like arithmetic operations, decision making and loops.<br>Interpretation of flowcharts.                                                                                                                      |
|               | <b>Module 5</b> | <b>Advantages and Limitations:</b><br>Advantages of algorithms and flowcharts in problem solving. Limitations such as complexity and time consumption. Comparison between algorithms and flowcharts.                                                                                                                               |
| <b>Unit 3</b> | <b>Module 1</b> | <b>Operating System Concepts:</b><br>Definition and functions of operating systems. Evolution of operating systems. Types of operating systems: batch, time-sharing, real-time, distributed systems.                                                                                                                               |
|               | <b>Module 2</b> | <b>Command Prompt (CMD):</b><br>Introduction to command line interface. Basic commands such as title, color, tree, directory navigation, file management commands. System                                                                                                                                                          |

|                    |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |                                                                                                                                                                                                                   | utilities for troubleshooting and diagnostics.                                                                                                                                                                                  |
|                    | <b>Module 3</b>                                                                                                                                                                                                   | <b>Introduction to Linux:</b><br>Overview of Linux operating system, features and advantages. Basic architecture and components of Linux system. Comparison with other operating systems.                                       |
|                    | <b>Module 4</b>                                                                                                                                                                                                   | <b>Linux File System:</b><br>Structure of Linux file system, directories and hierarchy. File handling concepts such as creating, deleting and managing files. Permissions and access control basics.                            |
|                    | <b>Module 5</b>                                                                                                                                                                                                   | <b>Linux Commands and Installation:</b><br>Basic Linux commands for file handling and system operations. Hardware and software requirements for Linux installation. Steps involved in installation and booting of Linux system. |
| <b>Unit 4</b>      | <b>Module 1</b>                                                                                                                                                                                                   | <b>MS Word Basics:</b><br>Introduction to word processing. Creating, editing and formatting documents. Use of fonts, styles, alignment and page setup.                                                                          |
|                    | <b>Module 2</b>                                                                                                                                                                                                   | <b>Advanced MS Word:</b><br>Working with tables, inserting images and objects. Mail merge for bulk document creation. Macros and advanced formatting tools.                                                                     |
|                    | <b>Module 3</b>                                                                                                                                                                                                   | <b>MS Excel Basics:</b><br>Introduction to spreadsheets. Working with worksheets, rows, columns and cells. Basic formulas and cell referencing.                                                                                 |
|                    | <b>Module 4</b>                                                                                                                                                                                                   | <b>Advanced MS Excel:</b><br>Use of functions, charts and graphs. Data visualization techniques. Formatting worksheets and printing options.                                                                                    |
|                    | <b>Module 5</b>                                                                                                                                                                                                   | <b>MS PowerPoint:</b><br>Introduction to presentations. Creating slides, applying layouts and themes. Adding animations, transitions, images, audio and video.                                                                  |
| <b>Note:</b>       | Each Unit is Equivalent to 1 Credit – 15 Hrs. / Week of Theory and 1 Credit consist of 5 Modules. Each Module is Equivalent to 3 Hrs. or Multiple of 3 Hrs.                                                       |                                                                                                                                                                                                                                 |
| <b>Examination</b> | Part A: Multiple Choice / Short Answer Type based on Level of Study<br>Part B: Short Type Questions.<br>Part C: Essay Type Questions.<br>Note: Part A & B Questions Covers all Units and Part C from last 2 Units |                                                                                                                                                                                                                                 |
| <b>Text Book</b>   | 1) P.K. Sinha & P. Sinha – <i>Foundations of Computing</i><br>2) Sagman S – <i>MS Office for Windows</i><br>3) ITL Educational Society – <i>Introduction to IT</i>                                                |                                                                                                                                                                                                                                 |
| <b>References</b>  | 1) Miller M – <i>Absolute Beginners Guide to Computer Basics</i><br>2) Stanford CS101 Resources                                                                                                                   |                                                                                                                                                                                                                                 |

|                              |                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                                     |                |
|------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------------------------------|----------------|
| <b>Programme:</b>            |                      | <b>B.Tech. CSE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Semester:</b>     | <b>I</b>                            |                |
| <b>Course Code:</b>          |                      | <b>TAA.13.101</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Course Title:</b> | <b>Basic Electrical Engineering</b> |                |
|                              |                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                                     |                |
| <b>Scheme of Instruction</b> |                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                      | <b>Scheme of Evaluation</b>         |                |
| <b>Total Duration</b>        | <b>45 Hrs.</b>       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                      | <b>Max. Marks</b>                   | <b>100</b>     |
| <b>Hours/Week</b>            | <b>3 Hrs.</b>        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                      | <b>Assignment/IA</b>                | <b>45</b>      |
| <b>Credits</b>               | <b>4</b>             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                      | <b>Attendance</b>                   | <b>05</b>      |
| <b>Instruction Delivery</b>  | <b>L:3, T:0, P:1</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                      | <b>End Semester Exam</b>            | <b>50</b>      |
| <b>Course Basket</b>         | <b>Major</b>         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                      | <b>Exam Duration</b>                | <b>2.5 Hr.</b> |
| <b>Instruction Mode</b>      | <b>Regular</b>       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                      | <b>Evaluation</b>                   | <b>Grade</b>   |
| <b>Course Objectives</b>     |                      | <div>1. Equip students with a strong understanding of electrical circuit fundamentals and laws, including Ohm's law and Kirchhoff's laws.</div> <div>2. Enable students to analyze and simplify electrical networks using circuit analysis techniques and network theorems.</div> <div>3. Develop proficiency in solving AC circuit problems and understanding resonance phenomena.</div> <div>4. Build knowledge of magnetically coupled circuits and electromagnetic principles.</div> <div>5. Provide insights into the working and applications of transformers and magnetic circuits in real-world scenarios.</div>                                                                                                  |                      |                                     |                |
| <b>Course Outcomes</b>       |                      | <div><b>CO1:</b> Demonstrate a thorough understanding of electrical circuit fundamentals and effectively apply Kirchhoff's and Ohm's laws to solve complex circuits.</div> <div><b>CO2:</b> Apply circuit analysis techniques like Mesh/Loop and Nodal Analysis to design and simplify electrical networks.</div> <div><b>CO3:</b> Analyze and solve AC circuits, understanding resonance effects and phasor representations.</div> <div><b>CO4:</b> Understand and apply principles of mutual inductance, electromagnetic concepts, and magnetic circuits.</div> <div><b>CO5:</b> Design and evaluate transformer-based systems and understand their practical applications in power transmission and electronics.</div> |                      |                                     |                |
| <b>Content</b>               |                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                                     |                |
| <b>Unit 1</b>                | <b>Module 1</b>      | Understanding energy flow in nature through ancient Indian perspectives such as “Prana” (life energy) and its analogy to electric current.<br>Conceptual parallels between open and closed circuits and traditional Indian systems of continuity and interruption (e.g., irrigation and water                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                                     |                |

|               |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               |                 | <p>flow systems).</p> <p>Types of circuits: open, closed, series, and parallel.</p> <p>Basic circuit components: resistors, capacitors, inductors, and sources.</p> <p>Explanation of circuit elements through natural analogies:</p> <p>Resistance: friction</p> <p>Capacitance: storage</p> <p>Inductance: cyclic energy flow</p> <p>Applications linked with traditional Indian engineering practices such as temple lighting systems and metallurgy.</p>                                                                                                                                                                                                                                                      |
|               | <b>Module 2</b> | <p><b>Ohm's Law and Kirchhoff's Laws:</b></p> <p>Ohm's Law interpreted through balance and cause effect principles found in Indian philosophy (e.g., Nyaya philosophy).</p> <p>Kirchhoff's Current Law (KCL) connected to the principle of conservation, similar to conservation ideas in ancient Indian scientific thought.</p> <p>Kirchhoff's Voltage Law (KVL) related to cyclic balance concepts seen in Vedic cosmology (energy balance in cycles).</p> <p>Explanation and derivation of Ohm's Law.</p> <p>Practical application of KCL and KVL in solving circuits.</p> <p>Real-life applications using both modern circuits and analogies from traditional water distribution and energy flow systems.</p> |
|               | <b>Module 3</b> | <p><b>Circuit Parameters:</b></p> <p>Characteristics of resistance, inductance, and capacitance.</p> <p>Role of these parameters in determining circuit behavior.</p> <p>Energy storage and dissipation properties.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|               | <b>Module 4</b> | <p><b>Basic Circuit Analysis:</b></p> <p>Simplifying circuits using series and parallel combinations.</p> <p>Delta-Star (Y) and Star-Delta transformations for circuit equivalency.</p> <p>Application in reducing complex networks.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|               | <b>Module 5</b> | <p><b>Analysis Techniques:</b></p> <p>Step-by-step explanation of Mesh/Loop Analysis.</p> <p>Solving circuits using Nodal Analysis.</p> <p>Practice problems for better understanding.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Unit 2</b> | <b>Module 1</b> | <p><b>Thevenin's and Norton's Theorems:</b></p> <p>Converting complex circuits into simplified equivalents.</p> <p>Deriving equivalent resistance and voltage/current sources.</p> <p>Real-life application in circuit design and analysis.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|               | <b>Module 2</b> | <p><b>Superposition Theorem and Maximum Power Transfer:</b></p> <p>Use of superposition for analyzing circuits with multiple sources.</p> <p>Conditions for achieving maximum power transfer to a load.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

|                    |                                                                                                                                                                                  |                                                                                                                                                                                                                      |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |                                                                                                                                                                                  | Practical examples and design implications.                                                                                                                                                                          |
|                    | <b>Module 3</b>                                                                                                                                                                  | <b>Introduction to AC Circuits:</b><br>Characteristics of AC currents and voltages.<br>Sinusoidal waveforms and their mathematical representation.<br>Phasor diagrams and complex numbers for analysis.              |
|                    | <b>Module 4</b>                                                                                                                                                                  | <b>RC and RLC Circuits:</b><br>Behavior of RC (Resistor-Capacitor) and RLC (Resistor-Inductor-Capacitor) circuits under AC.<br>Impedance calculations and phase relations.<br>Time constants and frequency response. |
|                    | <b>Module 5</b>                                                                                                                                                                  | <b>Resonance in Circuits:</b><br>Series resonance: impedance minimization and power maximization.<br>Parallel resonance: impedance maximization.<br>Applications in filters and communication systems.               |
| <b>Unit 3</b>      | <b>Module 1</b>                                                                                                                                                                  | <b>Magnetically Coupled Circuits:</b><br>Concept of mutual inductance and coupling coefficient.<br>Equivalent circuits for coupled inductors.<br>Applications like transformers and RF circuits.                     |
|                    | <b>Module 2</b>                                                                                                                                                                  | <b>Magnetic Circuits:</b><br>Fundamentals of magnetic flux, flux density, and reluctance.<br>Analogy between magnetic and electric circuits.<br>Calculation of magnetic field strength and efficiency.               |
|                    | <b>Module 3</b>                                                                                                                                                                  | <b>Electromagnetic Concepts:</b><br>Faraday's laws of electromagnetic induction.<br>Lenz's law and its applications in energy conversion.<br>Introduction to self-induction and eddy currents.                       |
|                    | <b>Module 4</b>                                                                                                                                                                  | <b>Transformers:</b><br>Construction and working principles of transformers.<br>Step-up and step-down transformers: uses and examples.<br>Ideal transformer equations and voltage/current relationships.             |
|                    | <b>Module 5</b>                                                                                                                                                                  | <b>Applications of Transformers:</b><br>Role in power transmission and distribution.<br>Efficiency optimization and loss reduction.<br>Real-world applications like voltage stabilization and adapters.              |
|                    |                                                                                                                                                                                  |                                                                                                                                                                                                                      |
| <b>Note:</b>       | Each Unit is Equivalent to 1 Credit – 15 Hrs./ Week of Theory and 1 Credit consist of 5 Modules. Each Module is Equivalent to 3 Hrs. or Multiple of 3 Hrs.                       |                                                                                                                                                                                                                      |
| <b>Examination</b> | Part A: Multiple Choice / Short Answer Type based on Level of Study<br>Part B: Short Questions of 100 – 200 Words Answer Type<br>Part C: Essay Type Question of 500 – 1000 Words |                                                                                                                                                                                                                      |

|                   |                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   | Note: Part A & B Questions Covers all Units and Part C from last 2 Units                                                                                                                                                                                                                                                                                                                              |
| <b>Text Book</b>  | <ol style="list-style-type: none"> <li>1. Electrical Technology by B.L. Theraja</li> <li>2. Basic Electrical Engineering by I.J. Nagrath</li> </ol>                                                                                                                                                                                                                                                   |
| <b>References</b> | <ol style="list-style-type: none"> <li>1. Principles of Electrical Engineering by V. Del Toro</li> <li>2. Engineering Circuit Analysis by W.H. Hayt &amp; J.E. Kemmerly</li> <li>3. Basic Electrical Engineering by V.K. Mehta &amp; Rohit Mehta</li> <li>4. Basic Electrical Engineering by Fitzgerald, Higginbotham &amp; Grabel</li> <li>5. Advanced Electrical Technology by H. Cotton</li> </ol> |

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                      |                      |         |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------|
| Programme:            | B.Tech. CSE                                                                                                                                                                                                                                                                                                                                                                                                                     | Semester:                                                                                                                            | I                    |         |
| Course Code:          | TAA.15.101                                                                                                                                                                                                                                                                                                                                                                                                                      | Course Title:                                                                                                                        | Engineering Drawing  |         |
|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                      |                      |         |
| Scheme of Instruction |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                      | Scheme of Evaluation |         |
| Total Duration        | 60 Hrs.                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                      | Max. Marks           | 100     |
| Hours/Week            | 3 Hrs.                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                      | Assignment/IA        | 45      |
| Credits               | 2                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                      | Attendance           | 05      |
| Instruction Delivery  | L:0, T:0, P:2                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                      | End Semester Exam    | 50      |
| Course Basket         | Major                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                      | Exam Duration        | 2.5 Hr. |
| Instruction Mode      | Regular                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                      | Evaluation           | Grade   |
| Course Outcomes       | CO1: Comprehend general projection theory, with an emphasis on the use of orthographic projection to represent three-dimensional objects in two-dimensional views.<br>CO2: Apply auxiliary or sectional views to most practically represent engineered parts.<br>CO3: Understand the intersection, development of surface of body and fasteners.<br>CO4: To interpret Orthographic, Isometric and Perspective views of objects. |                                                                                                                                      |                      |         |
| Content               |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                      |                      |         |
| Unit 1                | Module 1                                                                                                                                                                                                                                                                                                                                                                                                                        | Engineering drawing concepts: Introduction, drawing instruments and their usage, sheet layout, lettering.                            |                      |         |
|                       | Module 2                                                                                                                                                                                                                                                                                                                                                                                                                        | Introduction to Quadrants, Concept of horizontal and vertical plane                                                                  |                      |         |
|                       | Module 3                                                                                                                                                                                                                                                                                                                                                                                                                        | Projection of point in different quadrants.                                                                                          |                      |         |
|                       | Module 4                                                                                                                                                                                                                                                                                                                                                                                                                        | Projection of lines positioned in different orientations with respect to the principal plane.                                        |                      |         |
| Unit 2                | Module 1                                                                                                                                                                                                                                                                                                                                                                                                                        | Orthographic Projection: Introduction, Principle of Projection and methods.                                                          |                      |         |
|                       | Module 2                                                                                                                                                                                                                                                                                                                                                                                                                        | Planes of projection: first angles and third angle projection, projection of auxiliary plane.                                        |                      |         |
|                       | Module 3                                                                                                                                                                                                                                                                                                                                                                                                                        | Projection of planes                                                                                                                 |                      |         |
| Unit 3                | Module 1                                                                                                                                                                                                                                                                                                                                                                                                                        | Projection of Solids: Introduction, Types of solids, Cube, Pyramid, Hexagonal Pyramid, Triangular prism, cone, cylinder and frustum. |                      |         |
|                       | Module 2                                                                                                                                                                                                                                                                                                                                                                                                                        | Sections of Solids: Introduction, Sections of cube                                                                                   |                      |         |
|                       | Module 3                                                                                                                                                                                                                                                                                                                                                                                                                        | Sections of Prism                                                                                                                    |                      |         |
|                       | Module 4                                                                                                                                                                                                                                                                                                                                                                                                                        | Sections of Cylinder                                                                                                                 |                      |         |

|                               |                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                   |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               | <b>Module 5</b>                                                                                                                                                                                                                                                                                                                    | Sections of pyramids                                                                                                                                              |
| <b>Unit 4</b>                 | <b>Module 1</b>                                                                                                                                                                                                                                                                                                                    | Isometric Projection: Principle of Isometric projection, Isometric scale, isometric views, Free hand isometric view projection                                    |
|                               | <b>Module 2</b>                                                                                                                                                                                                                                                                                                                    | Introduction to computer aided Drafting CADr: why CAD, Applications and limitations of CAD, Hardware of CAD System and introduction to CAD software with example. |
|                               | <b>Module 3</b>                                                                                                                                                                                                                                                                                                                    | Commands and keyboard shortcuts used in CAD (AutoCAD).                                                                                                            |
|                               |                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                   |
| <b>Note:</b>                  | Each Unit is Equivalent to 1 Credit – 15 Hrs. / Week of Theory and 1 Credit consist of 5 Modules. Each Module is Equivalent to 3 Hrs. or Multiple of 3 Hrs.                                                                                                                                                                        |                                                                                                                                                                   |
| <b>Text Books / Reference</b> | 1. Bhat, N.D and M.Panchal (2008), Engineering Drawing character Pub<br>2. Gill, P.S (2006), Engineering Drawing (Geometrical Drawing) KATARIA pub.<br>3. Dhawan, R.K (2007) A textbook of Engineering Drawing S. Chand publications.<br>4. Narayan, K.L &P. Kannais (2008) Text Book on Engineering Drawing, SciTechpublications. |                                                                                                                                                                   |

|                              |                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                             |                |
|------------------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------|----------------|
| <b>Programme:</b>            |                      | <b>B.Tech. CSE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Semester:</b>     | <b>I</b>                    |                |
| <b>Course Code:</b>          |                      | <b>GDB.12.102</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Course Title:</b> | <b>Engineering Physics</b>  |                |
|                              |                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                             |                |
| <b>Scheme of Instruction</b> |                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      | <b>Scheme of Evaluation</b> |                |
| <b>Total Duration</b>        | <b>60 Hrs.</b>       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      | <b>Max. Marks</b>           | <b>100</b>     |
| <b>Hours/Week</b>            | <b>3 Hrs.</b>        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      | <b>Assignment/IA</b>        | <b>45</b>      |
| <b>Credits</b>               | <b>4</b>             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      | <b>Attendance</b>           | <b>05</b>      |
| <b>Instruction Delivery</b>  | <b>L:3, T:0, P:1</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      | <b>End Semester Exam</b>    | <b>50</b>      |
| <b>Course Basket</b>         | <b>Major</b>         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      | <b>Exam Duration</b>        | <b>2.5 Hr.</b> |
| <b>Instruction Mode</b>      | <b>Regular</b>       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      | <b>Evaluation</b>           | <b>Grade</b>   |
| <b>Course Objectives</b>     |                      | 1. To introduce electromagnetic concepts (vectors, magnetism, static electricity) from ancient Indian texts and compare them with modern theory.<br>2. To describe the concept of Vectors and their use in practical scenarios.<br>3. To describe the concepts related to Electric Fields.<br>4. To describe Quantum theory and its basic Postulates.<br>5. To understand basic principle of Laser.                                                                                                                  |                      |                             |                |
| <b>Course Outcomes</b>       |                      | CO1: Students will be able to contrast ancient Indian qualitative electromagnetic models with the modern Maxwell Lorentz framework.<br>CO2: To understand the significance of Maxwell’s equations as basis of Electromagnetic Theory.<br>CO3: To differentiate between the various types of referential frames.<br>CO4: To gain the knowledge on the basic concepts of Quantum Mechanics and its applications<br>CO5: To understand the working principle of various lasers and their application in various fields. |                      |                             |                |
| <b>Content</b>               |                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                             |                |
| <b>Unit 1</b>                | <b>Module 1</b>      | Indian Knowledge Systems in Electromagnetism, Vector concepts in Śulb asūtras, Ancient Indian views on magnetism & static electricity, Bṛhat Saṃ hitā & Kaśyapa Samhita references- IKS vs. modern electromagnetic Theory.                                                                                                                                                                                                                                                                                           |                      |                             |                |
|                              | <b>Module 2</b>      | A Brief introduction of vector algebra. Gradient of a scalar, Divergence and Curl of a vector with numerical                                                                                                                                                                                                                                                                                                                                                                                                         |                      |                             |                |
|                              | <b>Module 3</b>      | Gauss’s law and its applications, Electric potential and electric field. Problems based upon E and V.                                                                                                                                                                                                                                                                                                                                                                                                                |                      |                             |                |
|                              | <b>Module 4</b>      | Potential due to a monopole and dipole (qualitative). Work and energy in                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                             |                |

|                    |                                                                                                                                                                                                                   |                                                                                                                                                                      |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |                                                                                                                                                                                                                   | Electrostatics, Dielectrics, Polarization.                                                                                                                           |
|                    | <b>Module 5</b>                                                                                                                                                                                                   | Electric Displacement, Susceptibility and Permittivity. Lorentz Force Law: Magnetic field of a steady current (BiotSavart Law), Ampere's law.                        |
|                    | <b>Module 6</b>                                                                                                                                                                                                   | Electromotive force, Faraday's Law, Maxwell's equation (Basic Overview).                                                                                             |
| <b>Unit 2</b>      | <b>Module 1</b>                                                                                                                                                                                                   | Quantum theory: Limitations of classical theory, Planck's Hypothesis                                                                                                 |
|                    | <b>Module 2</b>                                                                                                                                                                                                   | De-Broglie Hypothesis, Wave particle duality, Matter waves, Davisson- Germer Experiment                                                                              |
|                    | <b>Module 3</b>                                                                                                                                                                                                   | Photoelectric effect and Compton Effect, Uncertainty principle                                                                                                       |
|                    | <b>Module 4</b>                                                                                                                                                                                                   | Heisenberg's Gamma Ray Microscope. Basic Postulates of Quantum mechanics: Wave function and its properties                                                           |
|                    | <b>Module 5</b>                                                                                                                                                                                                   | Born's interpretation, Normalization of Wave function and Orthogonal Wave functions                                                                                  |
| <b>Unit 3</b>      | <b>Module 1</b>                                                                                                                                                                                                   | Basic Concept of Schrodinger Wave equation: Time independent and time dependent                                                                                      |
|                    | <b>Module 2</b>                                                                                                                                                                                                   | Eigen Values and Eigen functions, Particle in a 1-D box (Qualitative treatment)                                                                                      |
|                    | <b>Module 3</b>                                                                                                                                                                                                   | Lasers: Interaction of radiation with matter, Energy levels of the system and transitions, Emission and absorption of radiation, Spontaneous and stimulated emission |
|                    | <b>Module 4</b>                                                                                                                                                                                                   | Einstein coefficients. Population inversion and optical pumping, Ruby Laser                                                                                          |
|                    | <b>Module 5</b>                                                                                                                                                                                                   | He-Ne Laser, CO <sub>2</sub> Laser, Industrial and medical applications of lasers                                                                                    |
|                    |                                                                                                                                                                                                                   |                                                                                                                                                                      |
| <b>Note:</b>       | Each Unit is Equivalent to 1 Credit – 15 Hrs./ Week of Theory and 1 Credit consist of 5 Modules. Each Module is Equivalent to 3 Hrs. or Multiple of 3 Hrs.                                                        |                                                                                                                                                                      |
| <b>Examination</b> | Part A: Multiple Choice / Short Answer Type based on Level of Study<br>Part B: Short Type Questions.<br>Part C: Essay Type Questions.<br>Note: Part A & B Questions Covers all Units and Part C from last 2 Units |                                                                                                                                                                      |
| <b>References</b>  | 1. Introduction to Electrodynamics, David J. Griffiths Prentice Hall of India, New Delhi.<br>2. Concepts of Modern Physics by Arthur Bieser, McGraw Hill.                                                         |                                                                                                                                                                      |