

**From Session-2025-26**

**Program Outcomes (POs)  
Program Specific Outcomes (PSO)  
Course Outcomes (COs)  
&  
Articulation Matrices**



**Department of Electrical Engineering**

**BRCM  
College of Engineering & Technology**

## **Washington Accord Knowledge and Attitude Profiles (WK)**

**WK1:** A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social sciences.

**WK2:** Conceptually-based mathematics, numerical analysis, data analysis, statistics and formal aspects of discipline support detailed analysis and modeling applicable to the discipline.

**WK3:** A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline.

**WK4:** Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.

**WK5:** Knowledge, including efficient resource use, environmental impacts, whole-life cost, re-use of resources, net zero carbon, and similar concepts, that supports engineering design and operations in a practice area

**WK6:** Knowledge of engineering practice (Technology) in the practice areas in the engineering discipline.

**WK7:** Knowledge of the role of engineering in society and identified issues in engineering practice in the discipline, such as the professional responsibility of an engineer to public safety and sustainable development.

**WK8:** Engagement with selected knowledge in the current research literature of the discipline, awareness of the power of critical thinking and creative approaches to evaluate emerging issues.

**WK9:** Ethics, inclusive behavior and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes.

## **Program Outcomes (POs)**

**1. Engineering knowledge:** Apply the knowledge of mathematics, natural science, engineering fundamentals, and an engineering specialization to develop to the solution of complex engineering problems.

**2. Problem analysis:** Identify, formulate, review research literature, and Analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development.

**3. Design/development of solutions:** Design creative solutions for complex engineering problems and design/develop system/ components processes to meet the identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society, and environment as required.

**4. Conduct investigations of complex problems:** Using e research-based knowledge including design of experiments, modeling, analysis and interpretation of data, to provide valid conclusions.

**5. Engineering Tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling recognizing their limitations to solve complex engineering problems.

**6. The engineer and The World:** Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, legal framework, culture and environment.

**7. Ethics:** Apply ethical principles and commit to professional ethics, human value, diversity and inclusion, adhere to national & international laws.

**8. Individual and Collaborative Team work:** Function effectively as an individual, and as a member or leader in diverse/ multi-disciplinary teams.

**9. Communication:** Communicate effectively and inclusively within the engineer community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentation considering cultural, language and learning differences.

**10. Project Management and Finance:** Apply knowledge and understanding of engineering management principles and economic decision –making and apply these to one’s own work, as a member and leader in a team, and to manage project and in multidisciplinary environments.

**11. Life-long learning:** Recognize the need for, and have the preparation and ability for (i) independent and life-long learning (ii) adaptability to new and emerging technologies and (iii) critical thinking in the broadest context of technological change..

### **Program Specific Outcomes (PSO)**

**PSO1:** Ability to utilize logical and technical skills to model, simulate and analyze electrical components and systems and empowering to provide socially acceptable technical solutions to real time electrical engineering problems with the application of modern and appropriate techniques for sustainable development’s to complex problem.

**PSO2:** Able to provide socially acceptable technical solution to complex Electrical engineering problems in generation, transmission and distribution of electrical power and its control.

### 3<sup>rd</sup> Semester

Course- Analog Electronics

Course Code: 26ESC-EE-201-H

| S.N0. | Course Outcomes                                                                                                                                                                                                                                                                                           | RBT*-Revised Bloom's Taxonomy |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to recall the fundamental concepts and characteristics of semiconductor devices, diode circuits, transistor amplifiers, biasing, frequency response, operational amplifiers, differential amplifiers, feedback, oscillators, filters, regulators, and analog electronic circuits..  | Recall (L1),                  |
| CO2   | Students will be able to explain the working principles and characteristics of semiconductor devices, diode circuits, transistor amplifiers, biasing, frequency response, operational amplifiers, differential amplifiers, feedback, oscillators, filters, regulators, and analog electronic circuits     | Understand (L2)               |
| CO3   | Students will be able to apply the principles of semiconductor devices, diode circuits, transistor amplifiers, biasing, frequency response, operational amplifiers, differential amplifiers, feedback, oscillators, filters, and regulators to solve analog circuit problems.                             | Apply (L3)                    |
| CO4   | Students will be able to analyze the performance of semiconductor devices, diode circuits, transistor amplifiers, biasing circuits, frequency response, operational amplifier applications, differential amplifiers, feedback circuits, oscillators, filters, regulators, and analog electronic circuits. | Analyze (L4)                  |
| CO5   | Students will be able to evaluate the performance parameters of analog electronic circuits involving semiconductor devices, transistor amplifiers, operational amplifiers, feedback techniques, oscillators, filters, and regulators for practical engineering applications.                              | Evaluate (L5)                 |

#### COPO-PSO Articulation Matrices

| Course Outcome<br>s (Cos) | (POs) |       |     |     |             |                     |     |     |     |      |      | PSOs  |       |
|---------------------------|-------|-------|-----|-----|-------------|---------------------|-----|-----|-----|------|------|-------|-------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5         | PO6                 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2  |
| Associate<br>WK Profiles  | WK1-4 | WK1-4 | WK5 | WK8 | WK2,<br>WK6 | WK1,<br>WK5,<br>WK7 | WK9 | —   | —   | —    | WK8  | WK3-6 | WK4-7 |
| CO1                       | 3     | 2     | —   | —   | —           | —                   | —   | —   | —   | —    | —    | 3     | 2     |
| CO2                       | 3     | 3     | —   | —   | 2           | —                   | —   | —   | —   | —    | —    | 3     | 2     |
| CO3                       | 3     | 3     | 2   | —   | 2           | —                   | —   | —   | —   | —    | —    | 3     | 3     |
| CO4                       | 3     | 3     | 3   | 3   | 3           | —                   | —   | —   | —   | —    | —    | 3     | 3     |
| CO5                       | 3     | 3     | 3   | 3   | 3           | 2                   | —   | —   | —   | —    | 2    | 3     | 3     |
| Average<br>Matrix         | 3.0   | 2.8   | 2.7 | 3.0 | 2.5         | 2.0                 |     |     |     |      | 2.0  | 3.0   | 2.6   |



**Course- Electric Circuit Analysis**  
**Course Code: 26PCC-EE-203-H**

| S.N0. | Course Outcomes                                                                                                                                                                                                                                                                                           | RBT*-Revised Bloom's Taxonomy |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to recall the concepts of network theorems, node and mesh analysis, first- and second-order networks, sinusoidal steady-state analysis, network synthesis, Laplace transforms, two-port networks, network functions, and network topology.                                          | Recall (L1),                  |
| CO2   | students will be able to explain the principles of network theorems, dependent sources, transient and steady-state responses, initial and final conditions, mutual coupled circuits, positive-real functions, network synthesis, Laplace transforms, transfer functions, and two-port network parameters. | Understand (L2)               |
| CO3   | Students will be able to apply network theorems, node and mesh analysis, differential-equation techniques, Laplace-transform methods, and two-port network equations to solve AC and DC electrical circuits.                                                                                              | Apply (L3)                    |
| CO4   | Students will be able to analyze transient and steady-state responses, first- and second-order networks, three-phase and mutually coupled circuits, network synthesis, transfer functions, poles and zeros, and interconnections of two-port networks using appropriate circuit-analysis techniques.      | Analyze (L4)                  |
| CO5   | Students will be able to evaluate electrical networks by comparing suitable analysis and synthesis techniques and assessing network responses, network functions, two-port networks, and network topology for effective circuit analysis and design.                                                      | Evaluate (L5)                 |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |               |     |     |     |      |      | PSOs  |       |
|---------------------------|-------|-------|-----|-----|----------|---------------|-----|-----|-----|------|------|-------|-------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6           | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2  |
| Associate WK Profiles     | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1, WK5, WK7 | WK9 | —   | —   | —    | WK8  | WK3-6 | WK4-7 |
| CO1                       | 3.0   | 2.0   | —   | —   | —        | —             | —   | —   | —   | —    | —    | 3.0   | 2.0   |
| CO2                       | 3.0   | 3.0   | —   | —   | 2.0      | —             | —   | —   | —   | —    | —    | 3.0   | 2.0   |
| CO3                       | 3.0   | 3.0   | 2.0 | —   | 3.0      | —             | —   | —   | —   | —    | —    | 3.0   | 3.0   |
| CO4                       | 3.0   | 3.0   | 3.0 | 2.0 | 3.0      | —             | —   | —   | —   | —    | —    | 3.0   | 3.0   |
| CO5                       | 3.0   | 3.0   | 3.0 | 3.0 | 3.0      | 2.0           | —   | —   | —   | —    | 2.0  | 3.0   | 3.0   |
| Average Matrix            | 3.0   | 2.8   | 2.7 | 2.5 | 2.8      | 2.0           |     |     |     |      | 2.0  | 3.0   | 2.6   |

**Course- Electrical Machines-I**  
**Course Code: 26PCC-EE-201-H**

| S.N0.      | Course Outcomes                                                                                                                                                                                                                                                                             | RBT*-Revised Bloom's Taxonomy |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>CO1</b> | Students will be able to recall the concepts of magnetic circuits; construction and types of DC machines; DC machine configurations and characteristics; motoring, generating and braking modes; and construction, types and basic parameters of single-phase and three-phase transformers. | <b>Recall (L1),</b>           |
| <b>CO2</b> | Students will be able to understand the principles of magnetic circuits, operation and performance of DC machines, characteristics of different DC machine configurations, motoring, generating and braking modes, and operating principles of single-phase and three-phase transformers.   | <b>Understand (L2)</b>        |
| <b>CO3</b> | Students will be able to apply the principles of magnetic circuits, DC machines and transformers <b>to determine</b> flux, MMF, reluctance, EMF, torque, speed, losses, efficiency, voltage regulation and other performance parameters.                                                    | <b>Apply (L3)</b>             |
| <b>CO4</b> | Students will be able to analyze magnetic circuits, different DC machine configurations and their characteristics, motoring, generating and braking modes, and the performance of single-phase and three-phase transformers under different operating conditions.                           | <b>Analyze (L4)</b>           |
| <b>CO5</b> | Students will be able to evaluate the performance and suitability of magnetic circuits, DC machines, different operating modes of DC machines, and single-phase and three-phase transformers for specified electrical applications.                                                         | <b>Evaluate (L5)</b>          |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos)        | (POs) |       |     |     |             |                     |     |     |     |      |      | PSOs  |       |
|----------------------------------|-------|-------|-----|-----|-------------|---------------------|-----|-----|-----|------|------|-------|-------|
|                                  | PO1   | PO2   | PO3 | PO4 | PO5         | PO6                 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2  |
| <b>Associate<br/>WK Profiles</b> | WK1-4 | WK1-4 | WK5 | WK8 | WK2,<br>WK6 | WK1,<br>WK5,<br>WK7 | WK9 | —   | —   | —    | WK8  | WK3-6 | WK4-7 |
| <b>CO1</b>                       | 3     | 2     | —   | —   | —           | —                   | —   | —   | —   | —    | —    | 2     | 1     |
| <b>CO2</b>                       | 3     | 2     | 2   | —   | —           | —                   | 1   | —   | —   | —    | —    | 3     | 2     |
| <b>CO3</b>                       | 3     | 3     | 2   | 2   | 2           | —                   | 1   | —   | —   | —    | 1    | 3     | 3     |
| <b>CO4</b>                       | 3     | 3     | 2   | 3   | 2           | 1                   | 2   | 1   | 1   | —    | 1    | 3     | 3     |
| <b>CO5</b>                       | 3     | 3     | 3   | 3   | 2           | 1                   | 2   | 1   | 1   | 1    | 2    | 3     | 3     |
| Average Matrix                   | 3.0   | 2.6   | 2.3 | 2.7 | 2.0         |                     |     | 1.0 | 1.0 | 1    |      | 2.8   | 2.4   |

## Course- Measurement and Instrumentation

Course Code: 26PCC-EE-205-H

| S.NO. | Course Outcomes                                                                                                                                                                                                                                                                                                                                                                  | RBT*-Revised Bloom's Taxonomy |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to recall the basic concepts, terminology, SI units, standards, types of errors, static characteristics, generalized measurement systems, controlling and damping methods, measuring instruments, CRO, function generator, transducers, bridges, wattmeter, energy meters, power factor and frequency meters.                                              | Recall (L1)                   |
| CO2   | Students will be able to understand the construction, working principles, operating characteristics and limitations of measuring instruments, CRO, function generator, transducers, PMMC, moving-iron, electrodynamics, induction, electrostatic and hot-wire instruments, wattmeter, energy meters, power factor and frequency meters.                                          | Understand (L2)               |
| CO3   | Students will be able to apply measurement principles, instrument characteristics and bridge techniques to determine electrical quantities and parameters such as voltage, current, power, power factor, frequency, resistance and other physical variables using appropriate instruments and measurement methods.                                                               | Apply (L3)                    |
| CO4   | Students will be able to analyze errors, accuracy, precision, sensitivity, resolution and limitations of measuring instruments and analyze the performance of PMMC, moving-iron, electrodynamics, induction and electrostatic instruments, wattmeter, energy meters, transducers and AC/DC bridge methods.                                                                       | Analyze (L4)                  |
| CO5   | Students will be able to evaluate and select suitable measuring instruments, transducers and measurement techniques for electrical and physical quantities by considering accuracy, errors, sensitivity, range, limitations and practical requirements, including low- and high-resistance measurements using Wheatstone bridge, Kelvin double bridge, Megohm bridge and Megger. | Evaluate (L5)                 |

### CO- -PO-PSO Articulation Matrices with WK

| Course Outcome s (Cos) | (POs) |       |     |     |          |               |     |     |     |      |      | PSOs  |          |
|------------------------|-------|-------|-----|-----|----------|---------------|-----|-----|-----|------|------|-------|----------|
|                        | PO1   | PO2   | PO3 | PO4 | PO5      | PO6           | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK Profiles | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1, WK5, WK7 | WK9 | —   | —   | —    | WK8  | WK4-6 | WK5, WK9 |
| CO1                    | 3.0   | —     | —   | —   | 2.0      | —             | —   | —   | —   | —    | —    | 3.0   | —        |
| CO2                    | 3.0   | 2.0   | —   | —   | 2.0      | —             | —   | —   | —   | —    | —    | 3.0   | —        |
| CO3                    | 3.0   | 3.0   | —   | —   | 3.0      | —             | —   | —   | —   | —    | —    | 3.0   | 2.0      |
| CO4                    | 3.0   | 3.0   | —   | 3.0 | 3.0      | —             | —   | —   | —   | —    | —    | 3.0   | 2.0      |
| CO5                    | 3.0   | —     | —   | —   | 2.0      | —             | —   | —   | 3.0 | —    | —    | 3.0   | 2.0      |
| AVERAGE TRIXMA VALUE   | 3.0   | 2.7   |     | 3.0 | 2.4      |               |     |     | 3.0 |      |      | 3.0   | 2.0      |

**Course- Electric Circuit Analysis Lab**
**Course Code: 26LC-EE-203-H**

| S.NO. | Course Outcomes                                                                                                                                                                                                                           | RBT*-Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to recall the basic concepts of electronic components, semiconductor devices, circuit components, measuring instruments and laboratory equipment used in analog electronics experiments.                            | Recall (L1)                   |
| CO2   | Students will be able to understand the operating principles, characteristics and experimental procedures of analog electronic devices and circuits and the use of laboratory instruments.                                                | Understand (L2)               |
| CO3   | Students will be able to apply analog electronics concepts to perform experiments, measure circuit parameters and verify the characteristics and performance of electronic devices and circuits using appropriate laboratory instruments. | Apply (L3)                    |
| CO4   | Students will be able to analyze experimental observations, measured parameters, plotted characteristics and performance of analog electronic circuits and compare theoretical and practical results, if required.                        | Analyze (L4)                  |
| CO5   | Students will be able to evaluate and document experimental results systematically by preparing laboratory records, technical observations and reports related to analog electronic devices and practical circuits.                       | Evaluate (L5)                 |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |               |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|---------------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6           | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK Profiles    | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1, WK5, WK7 | WK9 | —   | —   | —    | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3.0   | —     | —   | —   | 2.0      | —             | —   | —   | —   | —    | —    | 3.0   | —        |
| CO2                       | 3.0   | 2.0   | —   | —   | 2.0      | —             | —   | —   | —   | —    | —    | 3.0   | —        |
| CO3                       | 3.0   | 3.0   | 2.0 | —   | 3.0      | —             | —   | —   | —   | —    | —    | 3.0   | 2.0      |
| CO4                       | 3.0   | 3.0   | —   | 3.0 | 3.0      | —             | —   | —   | —   | —    | —    | 3.0   | 2.0      |
| CO5                       | 3.0   | —     | —   | —   | 2.0      | —             | —   | —   | 3.0 | —    | —    | 3.0   | 2.0      |
| AVERAGE MATRIX VALUE      | 3.0   | 2.7   | 2.0 | 3.0 | 2.4      |               |     |     | 3.0 |      |      | 3.0   | 2.0      |

**Course- Electrical Machines-I Lab****Course Code: 26LC-EE-201-H**

| S.NO. | Course Outcomes                                                                                                                                                                             | RBT*-Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Recall the various measuring instrument. Students will be able to identify and recall various measuring instruments, laboratory apparatus, and electrical machines used in the experiments. | Recall (L1)                   |
| CO2   | Students will be able to explain the operating principles, experimental procedures, and theoretical concepts related to DC motors, transformers, and their performance tests.               | Understand (L2)               |
| CO3   | Students will be able to apply the relevant theoretical concepts using experimental kits to perform speed-control, parallel-operation, and other prescribed laboratory experiments.         | Apply (L3)                    |
| CO4   | Students will be able to analyze experimental observations, calculate required parameters, and interpret the obtained results and characteristics of DC machines and transformers.          | Analyze (L4)                  |
| CO5   | Students will be able to evaluate experimental results, maintain laboratory files systematically, and demonstrate their conceptual understanding through viva-voce.                         | Evaluate (L5)                 |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3.0   | –     | –   | –   | 2.0      | –        | –   | –   | –   | –    | –    | 3.0   | 1.0      |
| CO2                       | 3.0   | 2.0   | –   | –   | 2.0      | –        | –   | –   | –   | –    | –    | 3.0   | 2.0      |
| CO3                       | 3.0   | 3.0   | 2.0 | –   | 3.0      | –        | 2.0 | 2.0 | –   | –    | –    | 3.0   | 3.0      |
| CO4                       | 3.0   | 3.0   | 2.0 | 3.0 | 3.0      | –        | –   | 2.0 | –   | –    | –    | 3.0   | 3.0      |
| CO5                       | 3.0   | 2.0   | –   | –   | 2.0      | –        | –   | 3.0 | 3.0 | –    | –    | 3.0   | 2.0      |
| AVERAGE MATRIX VALUE      | 3.0   | 2.5   | 2.0 | 3.0 | 2.4      |          | 2.0 | 2.3 | 3.0 |      |      | 3.0   | 2.2      |

**Course- Analog Electronics Lab Course****Code: 26LC-EE-207-H**

| S.NO. | Course Outcomes                                                                                                                                                                                                           | RBT*-Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to identify and recall the basic knowledge of electronic components, measuring instruments, and laboratory equipment used for analog electronics experiments.                                       | Recall (L1)                   |
| CO2   | Students will be able to Enables understanding of the experimental principle and operation of analog electronic devices before conducting experiments.                                                                    | Understand (L2)               |
| CO3   | Students will be able to apply the concepts of analog electronics to perform experiments, measure circuit parameters, and verify the characteristics of electronic devices and circuits.                                  | Apply (L3)                    |
| CO4   | Students will be able to analyze experimental results, calculate circuit parameters, plot characteristics, and evaluate the performance of analog electronic circuits such as amplifiers, rectifiers and OP-AMP circuits. | Analyze (L4)                  |
| CO5   | Students will be able to prepare technical reports, maintain laboratory records, and document experimental results systematically for analog electronic circuit applications.                                             | Evaluate (L5)                 |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK Profiles    | WK1-4 | WK2 | WK3 | WK4 | WK5 | WK7 | WK7 | WK8 | WK9 | WK9  | WK9  | WK4-6 | WK5, WK9 |
| CO1                       | 3.0   | –   | –   | –   | 2.0 | –   | –   | –   | –   | –    | –    | 3.0   | –        |
| CO2                       | 3.0   | 2.0 | –   | –   | 2.0 | –   | –   | –   | –   | –    | –    | 3.0   | –        |
| CO3                       | 3.0   | 3.0 | 2.0 | –   | 3.0 | –   | –   | –   | –   | –    | –    | 3.0   | 2.0      |
| CO4                       | 3.0   | 3.0 | –   | 3.0 | 3.0 | –   | –   | –   | –   | –    | –    | 3.0   | 2.0      |
| CO5                       | 3.0   | –   | –   | –   | 2.0 | –   | –   | –   | 3.0 | –    | –    | 3.0   | 2.0      |
| AVERAGE MATRIX VALUE      | 3.0   | 2.7 | 2.0 | 3.0 | 2.4 |     |     |     | 3.0 |      |      | 3.0   | 2.0      |

**Course- Measurement & Instrumentation Lab**  
**Course Code: 26LC-EE-205-H**

| S.N0. | Course Outcomes                                                                                                                                         | RBT*-Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Student will be able to identify different measuring instruments, laboratory apparatus and components used for measurement experiments.                 | Recall (L1)                   |
| CO2   | Student will be able to explain the construction, working principle and operation of various measurement and instrumentation Lab course.                | Understand (L2)               |
| CO3   | Students will be able to assemble the experimental setup, connect measuring instruments correctly, and perform calibration and measurement experiments. | Apply (L3)                    |
| CO4   | .Students will be able to record experimental observations, perform calculations, analyze measurement data.                                             | Analyze (L4)                  |
| CO5   | Students will be able to prepare Lab file, demonstrate conceptual understanding during laboratory viva-voce with proper documentation practices.        | Evaluate (L5)                 |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcomes (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|-----------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                       | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK         | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                   | 3.0   | –     | –   | –   | 2.0      | –        | –   | –   | –   | –    | –    | 3.0   | –        |
| CO2                   | 3.0   | 2.0   | –   | –   | 2.0      | –        | –   | –   | –   | –    | –    | 3.0   | –        |
| CO3                   | 3.0   | 3.0   | –   | –   | 3.0      | –        | –   | –   | –   | –    | –    | 3.0   | 2.0      |
| CO4                   | 3.0   | 3.0   | –   | 3.0 | 3.0      | –        | –   | –   | –   | –    | –    | 3.0   | 2.0      |
| CO5                   | 3.0   | –     | –   | –   | 2.0      | –        | –   | –   | 3.0 | –    | –    | 3.0   | 2.0      |
| AVERAGE MATRIX VALUE  | 3.0   | 2.7   |     | 3.0 | 2.4      |          |     |     | 3.0 |      |      | 3.0   | 2.0      |

## B.Tech. EE 4th Semester

**Course- Biology for Engineers Course**  
**Code: BSC-BIO-201G**

| S.NO. | Course Outcomes                                                                                                                                                                                                    | RBT*-Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to recall the fundamental concepts of biology, including living organisms, cells, biomolecular, microbes, genetic material and basic biological processes..                                  | Recall (L1)                   |
| CO2   | Students will be able to explain the structure and functions of living organisms, different types of cells and microorganisms, biomolecular, genetic code and the central dogma of molecular biology.              | Understand (L2)               |
| CO3   | Students will be able to apply biological and biotechnological concepts in the areas of agriculture, medicine and environment and relate them to practical applications.                                           | Apply (L3)                    |
| CO4   | Students will be able to analyze the principles and processes of genetic engineering, genetic information transfer, gene expression and biotechnology application                                                  | Analyze (L4)                  |
| CO5   | Students will be able to evaluate the economic importance of microorganisms and assess the applications of biomolecular, biotechnology, genetic engineering, genetic code and central dogma in practical contexts. | Evaluate (L5)                 |

### CO- -PO-PSO Articulation Matrices with WK

| Course Outcome s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                        | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK          | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                    | 1     | 1     | –   | –   | 1        | –        | –   | –   | –   | –    | –    | 1     | 1        |
| CO2                    | 2     | 2     | 1   | 1   | 1        | –        | –   | –   | –   | –    | –    | 2     | 1        |
| CO3                    | 2     | 3     | 2   | 2   | 2        | 2        | 1   | –   | –   | –    | –    | 2     | 2        |
| CO4                    | 2     | 3     | 2   | 3   | 2        | 1        | 1   | –   | –   | –    | 1    | 2     | 2        |
| CO5                    | 2     | 3     | 1   | 2   | 2        | 2        | 1   | –   | –   | 1    | 2    | 2     | 2        |
| AVERAGE MATRIX VALUE   | 1.8   | 2.4   | 1.5 | 2   | 1.6      | 1.7      | 1   |     |     | 1    | 1.5  | 1.8   | 1.6      |



**Course- Constitution of India Course**  
**Code: MC-105G**

| S.N0. | Course Outcomes                                                                                                                                                                                      | RBT*-Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to recall the meaning and fundamental concepts of the Constitution, constitutional law and constitutionalism.                                                                  | Recall (L1)                   |
| CO2   | Students will be able to understand the historical perspective, salient features and characteristics of the Constitution of India.                                                                   | Understand (L2)               |
| CO3   | Students will be able to apply the provisions relating to Fundamental Duties, their legal status and the Directive Principles of State Policy in relevant constitutional contexts.                   | Apply (L3)                    |
| CO4   | Students will be able to analyze the federal structure and distribution of legislative and financial powers between the Union and the States.                                                        | Analyze (L4)                  |
| CO5   | Students will be able to evaluate the Emergency Provisions, including National Emergency, President's Rule and Financial Emergency, and the constitutional scheme of Local Self-Government in India. | Evaluate (L5)                 |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcomes (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|-----------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                       | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK         | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                   | 1     | 1     | –   | –   | 1        | –        | –   | –   | –   | –    | –    | 1     | 1        |
| CO2                   | 2     | 2     | 1   | 1   | 1        | –        | –   | –   | –   | –    | –    | 2     | 1        |
| CO3                   | 2     | 3     | 2   | 2   | 2        | 2        | 1   | –   | –   | –    | –    | 2     | 2        |
| CO4                   | 2     | 3     | 2   | 3   | 2        | 1        | 1   | –   | –   | –    | 1    | 2     | 2        |
| CO5                   | 2     | 3     | 1   | 2   | 2        | 2        | 1   | –   | –   | 1    | 2    | 2     | 2        |
| AVERAGE MATRIX VALUE  | 1.8   | 2.4   | 1.5 | 2   | 1.6      | 1.7      | 1   |     |     | 1    | 1.5  | 1.8   | 1.6      |

**Course- Digital Electronic Course**  
**Code: PCC-EE-202G**

| S.NO. | Course Outcomes                                                                                                                                                                                         | RBT*-Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Student will be able to Recall the concepts of digital number systems, Boolean algebra, logic gates, logic families, combinational and sequential circuits, data converters, and semiconductor memories | Recall (L1)                   |
| CO2   | Student will be able to Explain the operation of logic families, combinational circuits (MUX, DEMUX, encoders, decoders, and adders), flip-flops, counters, ADC/DAC, and programmable logic device.     | Understand (L2)               |
| CO3   | Student will be able to Apply Boolean algebra and K-map techniques to simplify logic functions, design combinational and sequential circuits, and use memory and converter circuits in digital systems. | Apply (L3)                    |
| CO4   | Student will be able to Analyze the performance and design of combinational and sequential circuits, digital converters, and memory organization for solving digital system problems.                   | Analyze (L4)                  |
| CO5   | Student will be able to Evaluate and select suitable digital circuits, logic families, ADC/DAC architectures, memory devices, and programmable logic devices for practical digital system applications. | Evaluate (L5)                 |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3     | 2     | –   | –   | –        | –        | –   | –   | –   | –    | 1    | 2     | 1        |
| CO2                       | 3     | 2     | 1   | –   | –        | –        | –   | –   | –   | –    | 1    | 2     | 2        |
| CO3                       | 3     | 3     | 2   | 2   | 2        | –        | –   | –   | –   | –    | 1    | 2     | 3        |
| CO4                       | 3     | 3     | 2   | 3   | 2        | –        | –   | –   | –   | –    | 2    | 3     | 3        |
| CO5                       | 3     | 3     | 3   | 2   | 3        | –        | –   | –   | –   | 1    | 2    | 3     | 3        |
| AVERAGE MATRIX VALUE      | 3     | 2.6   | 2   | 2.3 | 2.3      |          |     |     |     | 1    | 1.4  | 2.4   | 2.4      |

**Course- Electrical Machines-II (LAB)****Course Code: PCC-EE-208G**

| S.N0. | Course Outcomes                                                                                                                                                                                            | RBT*-Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to Identify the laboratory apparatus, measuring instruments, induction machines, synchronous machines and experimental setup used in Electrical Machines-II Laboratory.              | Recall (L1)                   |
| CO2   | Students will be able to Explain the working principle, testing procedures and operating characteristics of induction motors, induction generators, synchronous generators and synchronous motors.         | Understand (L2)               |
| CO3   | Students will be able to Perform experiments on induction and synchronous machines to determine equivalent circuit parameters, performance characteristics, speed control, regulation and synchronization. | Apply (L3)                    |
| CO4   | Students will be able to analyze experimental results, calculate circuit parameters, plot characteristics, and evaluate the performance of LAB                                                             | Analyze (L4)                  |
| CO5   | Students will be able to prepare technical reports, maintain laboratory records, and document experimental results systematically for MACHINE applications.                                                | Evaluate (L5)                 |

**COPO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (Pos) |       |     |     |          |         |     |     |     |      |      | PSOs  |          |
|-----------------------|-------|-------|-----|-----|----------|---------|-----|-----|-----|------|------|-------|----------|
|                       | PO1   | PO2   | PO3 | PO4 | PO5      | PO6     | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK         | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5,7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                   | 3.0   | 2.0   | 1.0 | –   | 2.0      | –       | 1.0 | –   | –   | –    | –    | 3.0   | 2.0      |
| CO2                   | 3.0   | 3.0   | 1.0 | 2.0 | 2.0      | –       | 1.0 | –   | –   | –    | –    | 3.0   | 2.0      |
| CO3                   | 3.0   | 3.0   | 3.0 | 3.0 | 3.0      | 1.0     | 1.0 | –   | 1.0 | –    | 2.0  | 3.0   | 3.0      |
| CO4                   | 3.0   | 3.0   | 2.0 | 3.0 | 3.0      | 1.0     | 1.0 | –   | 1.0 | 1.0  | 2.0  | 3.0   | 3.0      |
| CO5                   | 2.0   | 2.0   | 2.0 | 2.0 | 2.0      | 1.0     | 1.0 | 1.0 | 2.0 |      |      |       |          |
| AVERAGE MATRIX VALUE  | 2.8   | 2.6   | 1.8 | 2.5 | 2.4      | 1.0     | 1.0 | 1.0 | 1.3 | 1.0  | 2.0  | 3.0   | 2.5      |

**Course- Electrical Machines-II**  
**Course Code: PCC-EE-206G**

| S.NO. | Course Outcomes                                                                                                                                                                                                                                                            | RBT*-Revised Bloom's Taxonomy |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to recall the construction, operating principles, rotating magnetic field, torque production and equivalent circuits of three-phase induction motors, induction generators and synchronous generators                                                | Recall (L1)                   |
| CO2   | Students will be able to understand the performance characteristics, testing, starting methods and speed-control techniques of induction motors, theories of single-phase induction motors, and voltage regulation of synchronous generators.                              | Understand (L2)               |
| CO3   | Students will be able to apply equivalent circuits, circle diagrams, speed-control methods, EMF equations, armature-reaction concepts, voltage-regulation methods, synchronization and parallel operation to solve electrical-machine problems.                            | Apply (L3)                    |
| CO4   | Students will be able to analyze the performance of induction motors, induction generators, synchronous generators and synchronous motors under different operating conditions, including transient behavior, power-angle characteristics and V-curves.                    | Analyze (L4)                  |
| CO5   | Students will be able to evaluate the suitability of induction motors, induction generators, synchronous generators and synchronous motors by selecting appropriate starting, control, synchronization and operating methods for industrial and power-system applications. | Evaluate (L5)                 |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3     | 2     | 1   | 2   | 2        | –        | –   | –   | –   | –    | 1    | 3     | 2        |
| CO2                       | 2     | 3     | 2   | 2   | 2        | –        | –   | –   | –   | –    | 1    | 3     | 2        |
| CO3                       | 3     | 3     | 2   | 3   | 2        | –        | –   | –   | –   | 1    | 2    | 3     | 3        |
| CO4                       | 3     | 3     | 3   | 3   | 3        | –        | –   | –   | –   | 1    | 2    | 3     | 3        |
| CO5                       | 3     | 3     | 3   | 2   | 2        | 1        | 1   | –   | 1   | 2    | 3    | 3     | 3        |
| AVERAGE MATRIX VALUE      | 2.8   | 2.8   | 2.2 | 2.4 | 2.2      | 1.0      | 1.0 |     | 1.0 | 1.3  | 1.8  | 3.0   | 2.6      |

**Course- Digital Electronic LAB**  
**Code: PCC- EE-204G**

| S.N0. | Course Outcomes                                                                                                                                                                                                                                | RBT*-Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to identify the digital ICs, logic gates, laboratory instruments, flip-flops, multiplexers, demultiplexers, comparators, counters, shift registers and seven-segment display used in the experiments, as per experiment. | Recall (L1)                   |
| CO2   | Students will be able to explain the experimental theory, truth tables, logic operations and working principles of experiment performed.( TTL gates, K-map circuits, MUX/DEMUX, comparator, flip-flops, shift registers and counters)          | Understand (L2)               |
| CO3   | Students will be able to apply digital logic concepts and appropriate laboratory tools to design, implement and verify combinational and sequential circuits using K-maps, flip-flops, counters and shift registers.                           | Apply (L3)                    |
| CO4   | Students will be able to analyze experimental observations and compare the practical outputs with theoretical truth tables and expected circuit operation to determine the performance of digital circuits.                                    | Analyze (L4)                  |
| CO5   | Students will be able to evaluate experimental results through viva-voce and systematically maintain the laboratory file, including circuit diagrams, observations, results and conclusions.                                                   | Evaluate (L5)                 |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3     | 2     | —   | —   | —        | —        | —   | —   | —   | —    | 1    | 2     | 1        |
| CO2                       | 3     | 2     | 1   | —   | —        | —        | —   | —   | —   | —    | 1    | 2     | 2        |
| CO3                       | 3     | 3     | 2   | 2   | 2        | —        | —   | —   | —   | —    | 1    | 2     | 3        |
| CO4                       | 3     | 3     | 2   | 3   | 2        | —        | —   | —   | —   | —    | 2    | 3     | 3        |
| CO5                       | 3     | 3     | 3   | 2   | 3        | —        | —   | —   | —   | 1    | 2    | 3     | 3        |
| AVERAGE MATRIX VALUE      | 3     | 2.6   | 2   | 2.3 | 2.3      |          |     |     |     | 1    | 1.4  | 2.4   | 2.4      |

**Course- Transmission and Distribution**  
**Code: PCC- EE-210G**

| S.N0. | Course Outcomes                                                                                                                                                                                            | RBT*-Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Recall the fundamental concepts of power systems, substations, distribution systems, transmission lines, mechanical design, insulators, cables, corona and HVDC transmission.                              | Recall (L1)                   |
| CO2   | Explain the operating principles and characteristics of power systems, transmission lines, substations, insulators, underground cables, corona and HVDC transmission.                                      | Understand (L2)               |
| CO3   | Apply the principles of transmission line analysis, mechanical design, cable calculations and voltage control to solve power transmission and distribution problems.                                       | Apply (L3)                    |
| CO4   | Analyze the performance of power transmission and distribution systems by evaluating line parameters, voltage regulation, sag and stress, insulator performance, cable characteristics and corona effects. | Analyze (L4)                  |
| CO5   | Evaluate and select appropriate power system components and transmission technologies to achieve reliable, efficient and economical operation of modern power systems.                                     | Evaluate (L5)                 |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                        | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK          | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                    | 3.0   | 2.0   | 1.0 | –   | 2.0      | –        | 1.0 | –   | –   | –    | –    | 3.0   | 2.0      |
| CO2                    | 3.0   | 3.0   | 2.0 | 2.0 | 2.0      | –        | 1.0 | –   | –   | –    | 1.0  | 3.0   | 2.0      |
| CO3                    | 3.0   | 3.0   | 3.0 | 3.0 | 3.0      | 1.0      | 1.0 | –   | –   | 1.0  | 2.0  | 3.0   | 3.0      |
| CO4                    | 3.0   | 3.0   | 2.0 | 3.0 | 3.0      | 1.0      | 1.0 | –   | 1.0 | 1.0  | 2.0  | 3.0   | 3.0      |
| CO5                    | 3.0   | 3.0   | 3.0 | 3.0 | 3.0      | 2.0      | 2.0 | 1.0 | 2.0 | 2.0  | 3.0  | 3.0   | 3.0      |
| AVERAGE MATRIX VALUE   | 3.0   | 2.8   | 2.2 | 2.8 | 2.6      | 1.3      | 1.2 | 1.0 | 1.5 | 1.3  | 2.0  | 3.0   | 2.6      |

**Course- Transmission and Distribution (LAB)**

Code: PCC- EE-212G

| S.N0. | Course Outcomes                                                                                                                                                              | RBT*-Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to identify and understand the laboratory instruments, equipment, components and safety precautions used in Transmission and Distribution experiments. | Recall (L1)                   |
| CO2   | Students will be able to explain the working principles and operating characteristics of Transmission and Distribution laboratory experiments.                               | Understand (L2)               |
| CO3   | Students will be able to perform Transmission and Distribution laboratory experiments by following the prescribed procedure, circuit connections and safety practices        | Apply (L3)                    |
| CO4   | CO4 Students will be able to analyze and interpret the experimental observations and results to verify theoretical concepts and evaluate system performance.                 | Analyze (L4)                  |
| CO5   | Students will be able to prepare laboratory record files, perform calculations, draw conclusions and present experimental findings in a systematic and professional manner.  | Evaluate (L5)                 |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcomes (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|-----------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                       | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK         | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                   | 3     | 2     | –   | –   | 2        | –        | 2   | 2   | –   | –    | –    | 3     | 2        |
| CO2                   | 3     | 2     | –   | –   | 2        | –        | 2   | –   | –   | –    | –    | 3     | 2        |
| CO3                   | 3     | 3     | 2   | 3   | 3        | –        | 3   | 3   | 2   | 2    | 2    | 3     | 3        |
| CO4                   | 3     | 3     | 2   | 3   | 2        | –        | 2   | 2   | 2   | 2    | 2    | 3     | 3        |
| CO5                   | 2     | 2     | 2   | 2   | 2        | –        | 2   | 2   | 3   | 3    | 2    | 3     | 2        |
| AVERAGE MATRIX VALUE  | 2.8   | 2.4   | 2.0 | 2.7 | 2.2      |          | 2.2 | 2.3 | 2.3 | 2.3  | 2.0  | 3.0   | 2.4      |

| S.N0. | Course Outcomes                                                                                                                                                                                                                                                                                                                                                    | RBT*-Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to Recall the concepts of types of signals, signal operations, LTI systems, Fourier Transform (FT), time and frequency domain analysis, Laplace Transform (LT), Z-Transform (ZT), system functions, poles and zeros, and sampling theorem used in continuous-time and discrete-time systems.                                                 | Recall (L1)                   |
| CO2   | Students will be able to Explain the concepts of types of signals, signal operations, LTI systems, Fourier Transform (FT), time and frequency domain analysis, Laplace Transform (LT), Z-Transform (ZT), system functions, poles and zeros, and sampling theorem used in continuous-time and discrete-time systems.                                                | Understand (L2)               |
| CO3   | Students will be able to Apply the concepts of types of signals, signal operations, LTI systems, Fourier Transform (FT), time and frequency domain analysis, Laplace Transform (LT), Z-Transform (ZT), system functions, poles and zeros, and sampling theorem to solve engineering problems involving                                                             | Apply (L3)                    |
| CO4   | Students will be able to Analyze types of signals, signal operations, LTI systems, Fourier Transform (FT), time and frequency domain analysis, Laplace Transform (LT), Z-Transform (ZT), system functions, poles and zeros, and sampling theorem to evaluate the performance of continuous-time and discrete-time systems.                                         | Analyze (L4)                  |
| CO5   | Students will be able to Evaluate the application of types of signals, signal operations, LTI systems, Fourier Transform (FT), time and frequency domain analysis, Laplace Transform (LT), Z-Transform (ZT), system functions, poles and zeros, and sampling theorem for solving complex engineering problems involving continuous-time and discrete-time systems. | Evaluate (L5)                 |

CO- -PO-PSO Articulation Matrices with WK

| Course Outcome s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                        | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK          | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                    | 3     | 2     | –   | –   | 2        | –        | –   | –   | –   | –    | –    | 3     | 2        |
| CO2                    | 3     | 2     | –   | –   | 2        | –        | –   | –   | –   | 1    | –    | 3     | 2        |
| CO3                    | 3     | 3     | 2   | 2   | 3        | –        | –   | –   | –   | 2    | 2    | 3     | 3        |
| CO4                    | 3     | 3     | 2   | 3   | 3        | –        | –   | –   | –   | 2    | 2    | 3     | 3        |
| CO5                    | 3     | 3     | 3   | 3   | 3        | –        | –   | –   | –   | 2    | 2    | 3     | 3        |
| AVERAGE MATRIX VALUE   | 3.0   | 2.6   | 2.3 | 2.7 | 2.6      |          |     |     |     | 1.8  | 2.0  | 3.0   | 2.6      |



**Course- Electromagnetic Fields**  
**Code: PCC- EE-216G**

| S.N0. | Course Outcomes                                                                                                                                                                                                                               | RBT*-Revised Bloom's Taxonomy |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to Recall the fundamental concepts of vector calculus, electrostatic fields, magnetic fields, Maxwell's equations, and electromagnetic wave propagation for understanding electromagnetic field theory.                 | Recall (L1)                   |
| CO2   | Students will be able to Explain the behavior of electric and magnetic fields, capacitance, inductance, field distributions, and electromagnetic wave propagation using appropriate mathematical formulations.                                | Understand (L2)               |
| CO3   | Students will be able to Apply vector calculus, Gauss's law, Ampere's law, Biot–Savart law, Laplace's and Poisson's equations, and Maxwell's equations to solve electromagnetic field problems using analytical methods and engineering tools | Apply (L3)                    |
| CO4   | Students will be able to Analyze electrostatic and magnetostatic fields, boundary conditions, magnetic materials, electromagnetic induction, and wave propagation under different engineering conditions.                                     | Analyze (L4)                  |
| CO5   | Students will be able to Evaluate electromagnetic field distributions, capacitance, inductance, wave propagation, and electromagnetic energy transfer to select appropriate engineering solutions for practical electrical applications.      | Evaluate (L5)                 |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                        | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK          | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                    | 3     | 2     | –   | –   | 2        | –        | –   | –   | –   | –    | –    | 3     | 2        |
| CO2                    | 3     | 2     | –   | 1   | 2        | –        | –   | –   | –   | 1    | –    | 3     | 2        |
| CO3                    | 3     | 3     | 2   | 2   | 3        | –        | –   | –   | –   | 2    | 2    | 3     | 3        |
| CO4                    | 3     | 3     | 2   | 3   | 3        | –        | –   | –   | –   | 2    | 2    | 3     | 3        |
| CO5                    | 3     | 3     | 3   | 3   | 3        | –        | 2   | –   | –   | 2    | 2    | 3     | 3        |
| AVERAGE MATRIX VALUE   | 3.0   | 2.6   | 2.3 | 2.3 | 2.6      |          | 2.0 |     |     | 1.8  | 2.0  | 3.0   | 2.6      |

**Course- Mathematics-III (Probability and Statistics)**

Code: PCC- EE-204G

| S.N0. | Course Outcomes                                                                                                                                                                                                                                            | RBT*-Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to Recall the fundamental concepts of numerical methods, statistical measures, polynomial equations, and mathematical tools required for engineering computations.                                                                   | Recall (L1)                   |
| CO2   | Students will be able to Explain numerical methods for solving polynomial and transcendental equations, interpolation, numerical differentiation and integration, and statistical techniques including measures of central tendency and correlation.       | Understand (L2)               |
| CO3   | Students will be able to Apply numerical methods and statistical techniques to solve engineering problems involving nonlinear equations, interpolation, numerical analysis, probability, random variables, and data analysis.                              | Apply (L3)                    |
| CO4   | Students will be able to Analyze engineering problems using numerical methods, statistical data analysis, correlation, regression, probability distributions, and hypothesis testing to interpret engineering data.                                        | Analyze (L4)                  |
| CO5   | Students will be able to Evaluate and select appropriate numerical methods and statistical techniques, including numerical differentiation, integration, and hypothesis testing, for solving complex engineering problems and data-driven decision making. | Evaluate (L5)                 |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcomes (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|-----------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                       | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK         | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                   | 3     | 2     | –   | –   | 2        | –        | –   | –   | –   | –    | –    | 3     | 2        |
| CO2                   | 3     | 2     | –   | 1   | 2        | –        | –   | –   | –   | 1    | –    | 3     | 2        |
| CO3                   | 3     | 3     | 2   | 2   | 3        | –        | –   | –   | –   | 2    | 2    | 3     | 3        |
| CO4                   | 3     | 3     | 2   | 3   | 3        | –        | –   | –   | 2   | 2    | 2    | 3     | 3        |
| CO5                   | 3     | 3     | 3   | 3   | 3        | –        | 2   | –   | 2   | 2    | 2    | 3     | 3        |
| AVERAGE MATRIX VALUE  | 3.0   | 2.6   | 2.3 | 2.3 | 2.6      |          | 2.0 |     | 2.0 | 1.8  | 2.0  | 3.0   | 2.6      |

## B.Tech. EE 5<sup>th</sup> Semester

Course- Electrical Drives  
Course Code: PEC-EE-03G

| S.NO. | Course Outcomes                                                                                                                                                                                                                                                                | RBT*-Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Student will be able to Recall and explain the fundamentals of electrical drives, DC drives, induction motor drives, closed-loop control, chopper-fed drives, multi-quadrant operation, motor power rating, scalar control (V/f), and slip-ring induction motor drives.        | Recall (L1)/ Understand (L2)  |
| CO2   | Student will be able to Apply the principles of electrical drives to determine speed, torque, operating point, motor rating, duty cycle, armature voltage control, flux weakening, chopper control, V/f control, and regenerative braking for various industrial applications. | Apply (L3)                    |
| CO3   | Student will be able to Analyze the performance characteristics of DC and induction motor drives under different operating conditions, including closed-loop control, multi-quadrant operation, PWM inverter control, slip regulation, and rotor resistance control.           | Analyze (L4)                  |
| CO4   | Student will be able to Evaluate the performance, efficiency, power rating, braking methods, controller design, and drive selection by comparing various DC and AC drive systems for different load requirements.                                                              | Evaluate (L5)                 |
| CO5   | Student will be able to Design and recommend suitable electrical drive systems using modern control techniques, power electronic converters, and motor selection criteria for industrial applications.                                                                         | Create(L6)                    |

### CO- -PO-PSO Articulation Matrices with WK

| Course Outcomes (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|-----------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                       | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK         | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                   | 3     | 2     | –   | –   | 1        | –        | 1   | –   | 1   | –    | 1    | 3     | 2        |
| CO2                   | 3     | 3     | 2   | –   | 3        | 1        | 1   | –   | 1   | 1    | 1    | 3     | 3        |
| CO3                   | 3     | 3     | 2   | 2   | 3        | –        | 1   | –   | 1   | 1    | 1    | 3     | 3        |
| CO4                   | 3     | 3     | 3   | 2   | 3        | 2        | 1   | 1   | 2   | 2    | 2    | 3     | 3        |
| CO5                   | 3     | 3     | 3   | 2   | 3        | 2        | 2   | 1   | 2   | 3    | 3    | 3     | 3        |
| AVERAGE MATRIX VALUE  | 3.0   | 2.8   | 2.5 | 2.0 | 2.6      | 1.7      | 1.2 | 1.0 | 1.4 | 1.8  | 1.6  | 3.0   | 2.8      |

**Course- Economics for Engineers**  
**Course Code: HSMC-01G**

| S.N0. | Course Outcomes                                                                                                                                                                                                                                      | RBT*-Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to explain the fundamental concepts of economics, types of economics, economic problems, Production Possibility Curve, economic laws, and the relationship between science, engineering, technology, and economic development. | Recall (L1)                   |
| CO2   | Students will be able to explain the concepts of demand, law of demand, elasticity of demand, production, and factors of production, laws of production, and economies and diseconomies of scale.                                                    | Understand (L2)               |
| CO3   | Students will be able to apply the concepts of fixed cost, variable cost, total cost, average cost, marginal cost, opportunity cost, and other costs in short-run and long-run production decisions.                                                 | Apply (L3)                    |
| CO4   | Students will be able to analyze different market structures, including perfect competition, monopoly, monopolistic competition, and oligopoly, based on their main features.                                                                        | Analyze (L4)                  |
| CO5   | Students will be able to evaluate the nature and characteristics of the Indian economy and assess the merits and demerits of privatization and globalization of the Indian economy.                                                                  | Evaluate (L5)                 |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3     | 2     | –   | –   | 1        | 2        | 1   | –   | 1   | –    | 1    | 3     | 2        |
| CO2                       | 3     | 2     | –   | –   | 1        | 2        | 1   | –   | 1   | –    | 2    | 3     | 2        |
| CO3                       | 3     | 3     | 2   | 2   | 2        | 1        | –   | –   | –   | 1    | 2    | 2     | 2        |
| CO4                       | 3     | 3     | 2   | 2   | 1        | 2        | –   | –   | –   | 2    | 2    | 2     | 2        |
| CO5                       | 3     | 3     | 2   | 2   | 2        | 2        | –   | –   | –   | 2    | 2    | 2     | 2        |
| AVERAGE MATRIX VALUE      | 3.0   | 2.6   | 2.0 | 2.0 | 1.4      | 1.8      | 1.0 |     | 1.0 | 1.7  | 1.8  | 2.4   | 2.0      |

**Course- Microprocessor & Microcontroller**  
**Course Code: PCC-EE-309G**

| S.NO. | Course outcomes                                                                                                                                                                                                                                   | RBT*-Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Student will be able to Recall and explain the architecture, instruction set, addressing modes, memory organization, programming concepts, and interfacing features of microprocessors and microcontrollers used in laboratory experiments.       | Recall (L1)                   |
| CO2   | Student will be able to Develop and execute assembly language programs using arithmetic, logical, branching, looping, timing, and data transfer instructions to solve engineering problems.                                                       | Understand (L2)               |
| CO3   | Student will be able to Analyze the operation of interfacing peripherals such as LEDs, seven-segment displays, keyboards, LCDs, ADC/DAC, timers/counters, serial communication, and interrupt systems using microprocessors and microcontrollers. | Apply (L3)                    |
| CO4   | Student will be able to Evaluate the performance of microprocessor and microcontroller-based hardware/software systems by testing, debugging, troubleshooting, and validating experimental results using appropriate development tool             | Analyze (L4)                  |
| CO5   | Student will be able to Design and implement embedded system applications by integrating microprocessors/microcontrollers with peripheral devices to develop real-time engineering solutions                                                      | Create (L6)                   |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3     | 2     | –   | –   | 2        | 1        | –   | –   | –   | –    | 1    | 3     | 3        |
| CO2                       | 3     | 3     | 3   | 2   | 3        | –        | –   | –   | –   | 1    | 2    | 3     | 3        |
| CO3                       | 3     | 3     | 3   | 3   | 3        | 1        | –   | –   | –   | 1    | 2    | 3     | 3        |
| CO4                       | 3     | 3     | 2   | 3   | 3        | 1        | 1   | –   | 2   | 2    | 3    | 3     | 3        |
| CO5                       | 3     | 3     | 3   | 3   | 3        | 2        | 1   | –   | 2   | 2    | 3    | 3     | 3        |
| AVERAGE MATRIX VALUE      | 3.0   | 2.8   | 2.8 | 2.8 | 2.8      | 1.3      | 1.0 |     | 2.0 | 1.5  | 2.2  | 3.0   | 3.0      |

**Course- Power system-1**  
**Course Code: PCC-EE-301G**

| S.N0. | Course Outcomes                                                                                                                                                                                                                                              | RBT*-Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to recall the fundamental concepts of three-phase power systems, per-unit system, synchronous machines, fault analysis, switchgear and protection, HVDC transmission, Solar PV systems, and Wind Energy systems.                       | Recall (L1)                   |
| CO2   | Students will be able to explain and understand the principles of three-phase network analysis, symmetrical components, sequence networks, protection schemes, HVDC converters, and renewable energy systems used in modern power systems                    | Understand (L2)               |
| CO3   | Students will be able to apply the principles of power system analysis for solving problems related to three-phase networks, fault current calculation, protection coordination, HVDC transmission, and grid integration of Solar PV and Wind Energy systems | Apply (L3)                    |
| CO4   | Students will be able to analyze the performance of power system components and networks under normal and fault conditions, evaluate protection schemes, compare AC and DC transmission, and analyze the characteristics of renewable energy systems         | Analyze (L4)                  |
| CO5   | Students will be able to evaluate power system performance and recommend suitable protection methods, transmission technologies, and renewable energy integration techniques for reliable, efficient, and sustainable electrical power systems.              | Evaluate (L5)                 |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcomes (Cos) | (POs) |       |     |     |          |         |     |     |     |      |      | PSOs  |          |
|-----------------------|-------|-------|-----|-----|----------|---------|-----|-----|-----|------|------|-------|----------|
|                       | PO1   | PO2   | PO3 | PO4 | PO5      | PO6     | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK         | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5,7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                   | 3     | 2     | –   | –   | 2        | 1       | –   | –   | –   | –    | 1    | 3     | 3        |
| CO2                   | 3     | 3     | 3   | 2   | 3        | –       | –   | –   | –   | 1    | 2    | 3     | 3        |
| CO3                   | 3     | 3     | 3   | 3   | 3        | 1       | –   | –   | –   | 1    | 2    | 3     | 3        |
| CO4                   | 3     | 3     | 2   | 3   | 3        | 1       | 1   | –   | 2   | 2    | 3    | 3     | 3        |
| CO5                   | 3     | 3     | 3   | 3   | 3        | 2       | 1   | –   | 2   | 2    | 3    | 3     | 3        |
| AVERAGE MATRIX VALUE  | 3.0   | 2.8   | 2.8 | 2.8 | 2.8      | 1.3     | 1.0 |     | 2.0 | 1.5  | 2.2  | 3.0   | 3.0      |

**Course- Computer Aided Electrical Machine Design**  
**Course Code: PCC-EE-313G**

| S.N0. | Course Outcomes                                                                                                                                                                                                                                                                                      | RBT*-Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to explain the fundamental aspects and basic design principles of electrical machines, including design factors, limitations, modern manufacturing techniques, output equations, specific electric and magnetic loadings, and factors affecting the size of rotating machines. | Understand (L2)               |
| CO2   | Students will be able to apply the design principles of three-phase induction motors and transformers, including selection of main dimensions, specific loadings, windings, conductors, slots, air gap, core, yoke, and other design parameters.                                                     | Apply (L3)                    |
| CO3   | Students will be able to analyze the design requirements of synchronous machines, including output equation, specific loadings, short-circuit ratio, stator and rotor design, magnetic circuit, field winding, and salient and non-salient pole construction.                                        | Analyze (L4)                  |
| CO4   | Students will be able to evaluate the design parameters and performance considerations of DC machines, including armature, field system, poles, windings, slots, air gap, and commutator.                                                                                                            | Evaluate(L5)                  |
| CO5   | Students will be able to design electrical machine systems using computer-aided design procedures, performance prediction programs, and optimization techniques for practical machine design problems.                                                                                               | Create (L6)                   |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3     | 1     | –   | –   | –        | –        | –   | –   | –   | –    | 1    | 2     | 2        |
| CO2                       | 3     | 2     | 2   | 1   | 2        | –        | –   | –   | –   | –    | 1    | 3     | 3        |
| CO3                       | 3     | 3     | 2   | 2   | 2        | –        | –   | –   | –   | –    | 1    | 3     | 3        |
| CO4                       | 3     | 3     | 3   | 2   | 2        | –        | –   | –   | –   | –    | 2    | 3     | 3        |
| CO5                       | 2     | 2     | 3   | 3   | 3        | –        | –   | 1   | 1   | 1    | 2    | 3     | 3        |
| AVERAGE MATRIX VALUE      | 2.8   | 2.2   | 2.5 | 2   | 2.25     | –        | –   | 1   | 1   | 1    | 1.4  | 2.8   | 2.8      |

**Course- Control System**  
**Course Code: PCC-EE-305G**

| S.NO. | Course Outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                              | RBT*-Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to Recall the fundamental concepts of control systems, including industrial control applications, mathematical modeling of physical systems, transfer functions, control hardware, feedback principles, block diagram representation, signal flow graphs, standard test signals, time-domain specifications, stability concepts, and basic terminology of Root Locus, Frequency Response, Controller Design, and State-Space Analysis. | Recall (L1)                   |
| CO2   | Students will be able to Understand the time response, stability criteria, frequency response characteristics, controller design concepts, and state-space representation of linear control systems.                                                                                                                                                                                                                                                         | Understand (L2)               |
| CO3   | Students will be able to Apply transfer function, Root Locus, Bode Plot, Nyquist Criterion, PID controllers, Lead-Lag compensators, and state-space techniques to solve control system problems.                                                                                                                                                                                                                                                             | Apply (L3)                    |
| CO4   | Students will be able to Analyze the stability, performance, controllability, observability, and frequency response of linear control systems using classical and modern control techniques.                                                                                                                                                                                                                                                                 | Analyze (L4)                  |
| CO5   | Students will be able to evaluate the performance of control systems using Root Locus, Bode Plot, Nyquist Criterion, PI/PID controllers, and Lead-Lag compensators, and select suitable techniques to achieve the desired performance specifications.                                                                                                                                                                                                        | Evaluate (L5)                 |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |      |      |          |         |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|------|------|----------|---------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3  | PO4  | PO5      | PO6     | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5  | WK8  | WK2, WK6 | WK1,5,7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3     | 2     | –    | –    | 1        | –       | –   | –   | –   | –    | 1    | 3     | 2        |
| CO2                       | 3     | 3     | 1    | 2    | 1        | –       | –   | –   | –   | –    | 1    | 3     | 2        |
| CO3                       | 2     | 3     | 3    | 2    | 3        | –       | –   | –   | –   | –    | 1    | 3     | 3        |
| CO4                       | 3     | 3     | 2    | 3    | 2        | –       | –   | –   | –   | –    | 1    | 3     | 2        |
| CO5                       | 2     | 3     | 3    | 2    | 3        | –       | –   | –   | –   | 1    | 2    | 3     | 3        |
| AVERAGE MATRIX VALUE      | 2.6   | 2.8   | 2.25 | 2.25 | 2        |         |     |     |     | 1    | 1.2  | 3     | 2.4      |



**Course- Control System Lab**  
**Course Code: LC-EE-307G**

| S.N0. | Course Outcomes                                                                                                                                                                                                                                            | RBT*-Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to Identify the laboratory apparatus, measuring instruments, servo motors, PLCs, PID trainer kit, compensators and software used for performing control system experiments. (Identification of Lab Apparatus & Experiment)           | Identify(L1)                  |
| CO2   | Students will be able to Explain the working principle and operation of open-loop and closed-loop control systems, servo motors, compensators, PID controllers and PLC-based control systems during viva. (Explanation of Working Principle of Experiment) | Explain(L2)                   |
| CO3   | Students will be able to Perform control system experiments such as servo motor characteristics, PID control, PLC-based water level and conveyor control, and analyze the practical performance. (Performance of Practical)                                | Perform(L3)                   |
| CO4   | Students will be able to Analyze and interpret the experimental observations, calculations and results of this lab.                                                                                                                                        | Analyze(L4)                   |
| CO5   | Students will be able to maintain practical records and demonstrate their understanding through viva.                                                                                                                                                      | Demonstrate(L5)               |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3     | 2     | –   | –   | 1        | –        | –   | –   | –   | –    | –    | 3     | 2        |
| CO2                       | 3     | 3     | 1   | –   | 1        | –        | –   | –   | –   | –    | –    | 3     | 2        |
| CO3                       | 2     | 3     | 3   | 2   | 3        | –        | –   | –   | –   | 1    | –    | 3     | 3        |
| CO4                       | 2     | 3     | 2   | 3   | 3        | –        | –   | –   | –   | 1    | –    | 3     | 3        |
| CO5                       | 1     | 2     | 1   | 2   | 2        | –        | –   | –   | 1   | 2    | 1    | 2     | 2        |
| AVERAGE MATRIX VALUE      | 2.2   | 2.6   | 1.8 | 2.3 | 2.0      |          |     |     | 1.0 | 1.3  | 1.0  | 2.8   | 2.4      |

**Course- Computer Aided Electrical Lab**  
**Course Code: LC-EE-315G**

| S.N0. | Course Outcomes                                                                                                                                                                                                                                   | RBT*-Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Student will be able to Identify and recall the laboratory equipment, MATLAB software environment, machine design parameters, and safety precautions required for electrical machine design experiments                                           | Identify(L1)                  |
| CO2   | Student will be able to Understand and explain the theoretical concepts, experimental procedures, and design methodology of electrical machines before performing laboratory experiments.                                                         | Explain(L2)                   |
| CO3   | Student will be able to Develop and execute MATLAB programs to determine the design parameters and main dimensions of transformers, induction motors, synchronous machines, and DC machines.                                                      | Perform(L3)                   |
| CO4   | Student will be able to Analyze and interpret the simulation outputs and experimental results to evaluate the performance and design parameters of electrical machines.                                                                           | Analyze(L4)                   |
| CO5   | Student will be able to Demonstrate comprehensive laboratory competency by presenting viva-voce responses, maintaining laboratory records/files, documenting experimental observations, and drawing appropriate conclusions based on the results. | Demonstrate(L5)               |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                        | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK          | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                    | 3     | 1     | –   | –   | 2        | –        | –   | –   | –   | –    | –    | 2     | 2        |
| CO2                    | 3     | 2     | –   | –   | 2        | –        | –   | –   | –   | –    | –    | 3     | 1        |
| CO3                    | 2     | 2     | 3   | 2   | 3        | –        | –   | –   | –   | –    | –    | 2     | 2        |
| CO4                    | 2     | 3     | 2   | 3   | 3        | –        | –   | –   | –   | –    | –    | 2     | 2        |
| CO5                    | 21    | 1     | –   | 1   | 2        | –        | 2   | 2   | 2   | –    | –    | 1     | 1        |
| AVERAGE MATRIX VALUE   | 2.2   | 1.8   | 2.5 | 2.0 | 2.4      |          | 2.0 | 2   | 2.0 |      |      | 2.0   | 1.6      |

**Course- Microprocessor & Microcontroller Lab**  
**Course Code: LC-EE-311G**

| S.NO. | Course Outcomes                                                                                                                                                                                                                                  | RBT*-Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to identify microprocessor and microcontroller laboratory kits, interfacing devices, programming tools, and peripheral components used in the experiments.                                                                 | Identify(L1)                  |
| CO2   | Students will be able to explain the architecture, instruction set, addressing modes, memory organization, programming concepts, and interfacing principles of microprocessors and microcontrollers during laboratory experiments and viva-voce. | Explain(L2)                   |
| CO3   | Students will be able to perform assembly language programming and execute experiments involving arithmetic, logical, branching, looping, timing, data transfer, and peripheral interfacing operations.                                          | Perform(L3)                   |
| CO4   | Students will be able to analyze experimental observations and results related to LEDs, seven-segment displays, keyboards, LCDs, ADC/DAC, timers/counters, serial communication, and interrupt systems.                                          | Analyze(L4)                   |
| CO5   | Students will be able to evaluate microprocessor and microcontroller-based experiments, debugging, troubleshooting, validating results, maintaining practical records, and demonstrating understanding through viva-voce.                        | Demonstrate(L5)               |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |      |      |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|------|------|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3  | PO4  | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5  | WK8  | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3     | 2     | –    | –    | 3        | –        | –   | –   | –   | –    | 1    | 3     | 2        |
| CO2                       | 3     | 3     | 2    | 2    | 3        | –        | –   | –   | –   | –    | 1    | 3     | 3        |
| CO3                       | 2     | 3     | 3    | 2    | 3        | –        | –   | –   | –   | 1    | –    | 3     | 3        |
| CO4                       | 2     | 3     | 3    | 3    | 3        | –        | –   | –   | 1   | 2    | 1    | 3     | 3        |
| CO5                       | 2     | 3     | 3    | 2    | 3        | –        | 2   | 2   | 2   | 2    | 1    | 3     | 3        |
| AVERAGE MATRIX VALUE      | 2.4   | 2.8   | 2.75 | 2.25 | 3        |          | 2   | 2   | 1.5 | 1.7  | 1    | 3     | 2.8      |

**Course- Power Systems–I Lab**  
**Course Code: LC-EE-303G**

| S.N0. | Course Outcomes                                                                                                                                                                                                                                                                                            | RBT*-Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to Identify and operate various laboratory instruments, relays, transmission line models, oil testing set, PV modules, wind energy setup, and simulation software used in power system protection and renewable energy experiments.                                                  | Identify(L1)                  |
| CO2   | Students will be able to Explain the principles of sequence reactance's, fault analysis, protective relays, Ferranti effect, transmission line behavior, oil testing, photovoltaic systems, wind energy systems, and power system simulation techniques                                                    | Explain(L2)                   |
| CO3   | Students will be able to Perform laboratory experiments and software simulations to determine sequence reactance, analyze faults, study relay characteristics, investigate transmission line performance, evaluate PV and wind energy characteristics, and carry out fault analysis using simulation tools | Perform(L3)                   |
| CO4   | Students will be able to Analyze and verify experimental and simulation results by calculating fault currents, relay characteristics, transmission line parameters, PV performance indices, wind power characteristics, and comparing analytical and simulated outcomes.                                   | Analyze(L4)                   |
| CO5   | Students will be able to Demonstrate troubleshooting skills, interpret experimental observations, answer viva questions, and prepare well-organized laboratory records and technical reports.                                                                                                              | Demonstrate(L5)               |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcomes (Cos) | (POs) |       |     |     |          |         |     |     |     |      |      | PSOs  |          |
|-----------------------|-------|-------|-----|-----|----------|---------|-----|-----|-----|------|------|-------|----------|
|                       | PO1   | PO2   | PO3 | PO4 | PO5      | PO6     | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK         | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5,7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                   | 3     | 2     | –   | –   | 3        | –       | –   | –   | –   | –    | 1    | 3     | 2        |
| CO2                   | 3     | 3     | 2   | 2   | 3        | –       | –   | –   | –   | –    | 1    | 3     | 3        |
| CO3                   | 2     | 3     | 3   | 2   | 3        | –       | –   | –   | –   | –    | –    | 3     | 3        |
| CO4                   | 2     | 3     | 3   | 3   | 3        | –       | –   | –   | 1   | 2    | 1    | 3     | 3        |
| CO5                   | 2     | 3     | 3   | 2   | 3        | –       | 2   | 2   | 2   | 2    | 1    | 3     | 3        |
| AVERAGE MATRIX VALUE  | 2.4   | 2.8   | 2.8 | 2.3 | 3.0      |         | 2.0 | 2.0 | 1.5 | 2.0  | 1.0  | 3.0   | 2.8      |

**Course- Power plant engineering**  
**Course Code: OEC-EE-07G**

| S.N0. | Course Outcomes                                                                                                                                                                                                                                                                                 | RBT*-Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to Recall the basic concepts, layout, components, operating principles, and subsystems of thermal power plants, including Rankin cycle, boilers, turbines, condensers, fuel handling, and feed water systems.                                                             | Recall (L1)                   |
| CO2   | Students will be able to Understand the operating principles and performance of gas turbine, combined cycle, and Integrated Gasified Combined Cycle (IGCC) power plants based on Brayton cycle analysis.                                                                                        | Understand (L2)               |
| CO3   | Students will be able to Apply the concepts of nuclear power generation by explaining the construction, operation, safety measures, and performance of different nuclear reactors.                                                                                                              | Apply (L3)                    |
| CO4   | Students will be able to Analyze the operating principles, layout, components, and performance of hydroelectric and renewable energy power plants, including wind, solar, tidal, geothermal, biogas, and fuel cell systems.                                                                     | Analyze (L4)                  |
| CO5   | Students will be able to Evaluate the techno-economic, environmental, and operational aspects of various power plants by comparing energy economics, tariffs, load characteristics, capital and operating costs, and pollution control techniques to justify suitable power generation options. | Evaluate (L5)                 |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                        | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK          | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                    | 3     | 2     | –   | –   | 1        | –        | –   | –   | –   | –    | –    | 1     | 2        |
| CO2                    | 3     | 3     | 2   | 1   | 2        | –        | –   | –   | –   | –    | –    | 2     | 3        |
| CO3                    | 3     | 3     | 2   | 2   | 2        | –        | –   | –   | –   | –    | –    | 2     | 3        |
| CO4                    | 3     | 3     | 2   | 2   | 2        | –        | –   | –   | –   | –    | –    | 3     | 3        |
| CO5                    | 2     | 3     | 3   | 2   | 2        | 1        | 2   | 1   | 1   | 2    | 2    | 3     | 3        |
| AVERAGE MATRIX VALUE   | 2.8   | 2.8   | 2.3 | 1.8 | 1.8      | 1.0      | 2.0 | 1.0 | 1.0 | 2.0  | 2.0  | 2.2   | 2.8      |

**Course- Practical training-1**  
**Course: PT-EE-317G**

| S.N0.      | Course Outcomes                                                                                                                                                                 | RBT*-Revised Bloom's Taxonomy |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>CO1</b> | Students will be able to Perform assigned industrial activities while following safety practices, work ethics, discipline, and organizational procedures during the internship. | <b>Apply (L3)</b>             |
| <b>CO2</b> | Students will be able to Analyze practical engineering problems encountered during the internship using engineering knowledge and modern tools.                                 | <b>Analyze (L4)</b>           |
| <b>CO3</b> | Students will be able to Present the internship work, technical activities, and outcomes effectively through a professional PowerPoint presentation.                            | <b>Understand (L2)</b>        |
| <b>CO4</b> | Students will be able to Prepare a comprehensive internship report documenting the work carried out, observations, and technical learning gained during the internship          | <b>Create(L6)</b>             |
| <b>CO5</b> | Students will be able to Evaluate their technical understanding and professional competency by answering questions confidently during the final viva-voce examination.          | <b>Evaluate(5)</b>            |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos)   | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|-----------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                             | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| <b>WK Associated</b>        | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| <b>CO1</b>                  | 3     | 2     | –   | –   | 2        | 1        | 2   | 2   | –   | –    | 1    | 2     | 2        |
| <b>CO2</b>                  | 3     | 3     | 2   | 2   | 3        | –        | –   | –   | –   | –    | 1    | 3     | 3        |
| <b>CO3</b>                  | 2     | 2     | –   | –   | 1        | –        | –   | –   | 3   | 3    | –    | 2     | 2        |
| <b>CO4</b>                  | 1     | 2     | –   | –   | 1        | –        | –   | –   | 3   | 3    | 2    | 2     | 2        |
| <b>CO5</b>                  | 2     | 2     | 1   | 1   | 2        | –        | 1   | 1   | 3   | 2    | 1    | 2     | 2        |
| <b>AVERAGE MATRIX VALUE</b> | 2.2   | 2.2   | 1.5 | 1.5 | 1.8      | 1.0      | 1.5 | 1.5 | 3.0 | 2.7  | 1.3  | 2.2   | 2.2      |

## B.Tech. EE 6<sup>th</sup> Semester

Course- Advance Electric Drives

Course Code: PEC-EE-18G

| S.NO. | Course Outcomes                                                                                                                                                                                                                             | RBT*-Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to Recall the operating principles, configurations, and basic control strategies of power converters and electrical drives, including induction, synchronous, permanent magnet, and switched reluctance motor drives. | Recall (L1)                   |
| CO2   | Students will be able to Explain power electronic converters, modulation techniques, motor control methods, and DSP-based controllers used in AC and DC drive systems                                                                       | Understand (L2)               |
| CO3   | Students will be able to Apply PWM techniques, reference-frame transformations, vector control, direct torque control, and DSP-based control methods for the operation of electrical drive systems.                                         | Apply (L3)                    |
| CO4   | Students will be able to Analyze the modeling, performance characteristics, speed-torque characteristics, and multi-quadrant operation of modern electrical drives.                                                                         | Analyze (L4)                  |
| CO5   | Students will be able to Evaluate suitable power converter and motor-drive control schemes using modern control techniques and DSP-based motion control for specified operating requirements.                                               | Evaluate (L5)                 |

### CO- -PO-PSO Articulation Matrices with WK

| Course Outcome s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                        | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| WK Associated          | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                    | 3     | 2     | –   | –   | 2        | –        | –   | –   | –   | –    | 1    | 3     | 3        |
| CO2                    | 3     | 3     | 2   | 2   | 2        | –        | –   | –   | –   | –    | 1    | 3     | 3        |
| CO3                    | 2     | 3     | 3   | 2   | 3        | –        | –   | –   | –   | –    | 1    | 3     | 3        |
| CO4                    | 2     | 3     | 2   | 3   | 2        | –        | –   | –   | 2   | 1    | 2    | 3     | 3        |
| CO5                    | 2     | 2     | 3   | 3   | 3        | –        | –   | 2   | 2   | 2    | 3    | 3     | 3        |
| AVERAGE MATRIX VALUE   | 2.4   | 2.6   | 2.5 | 2.5 | 2.4      |          |     | 2.0 | 2.0 | 1.5  | 1.6  | 3.0   | 3.0      |

**Course- Digital Signal Processing****Course Code: PEC-EE-04G**

| S.NO. | Course Outcomes                                                                                                                                                                 | RBT*-Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to recall the fundamental concepts of digital signals, signal processing systems, and their basic characteristics                                         | Recall (L1)                   |
| CO2   | Students will be able to explain the concepts of sampling, interpolation, aliasing, discrete-time signal operations, convolution, and correlation in digital signal processing. | Understand (L2)               |
| CO3   | Students will be able to analyze and apply Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT) techniques for frequency-domain representation of digital signals. | Apply (L3)                    |
| CO4   | Students will be able to evaluate digital signal processing operations and validate their performance using appropriate simulation software and analysis tools.                 | Analyze (L4)                  |
| CO5   | Students will be able to Evaluate digital filter characteristics and select suitable filter techniques to meet specified signal processing requirements                         | Evaluate (L5)                 |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| WK Associated             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3     | –     | –   | –   | 2        | –        | –   | –   | –   | –    | 1    | 3     | 2        |
| CO2                       | 3     | 3     | –   | –   | 2        | –        | –   | –   | –   | –    | 1    | 3     | 2        |
| CO3                       | 2     | 3     | 2   | 3   | 3        | –        | –   | –   | –   | –    | 1    | 3     | 3        |
| CO4                       | 2     | 3     | –   | 3   | 3        | –        | –   | –   | 2   | –    | 2    | 3     | 3        |
| CO5                       | 2     | 2     | 3   | 3   | 3        | –        | –   | –   | 2   | 1    | 2    | 3     | 3        |
| Average Matrix            | 2.4   | 2.8   | 2.5 | 3.0 | 2.6      |          |     |     | 2.0 | 1.0  | 1.4  | 3.0   | 2.6      |



**Course- Power Electronics**  
**Course Code: PCC-EE-306G**

| S.N0. | Course Outcomes                                                                                                                                                                                             | RBT*-Revised Bloom's Taxonomy/WK/PO/PSO |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| CO1   | Students will be able to Recall the basic knowledge about Power Diode, Power MOSFET, SCR, IGBT, and Power Semiconductor Devices this is essential in concept building in Power electronics subject.         | <b>Remember (L1)</b>                    |
| CO2   | Students will be able to Understand the, Conduction scheme of converter, choppers, commutation technique of SCR, Pulse transformer                                                                          | <b>Understand (L2)</b>                  |
| CO3   | Students will be able to Apply the basic knowledge of Power Electronics Devices and construct chopper and Inverter circuit.                                                                                 | <b>Apply (L3)</b>                       |
| CO4   | Students will be able to Analyze and Evaluate one, two, three, six and twelve pulse converts, force commutative converter, Modified McMurray bridge inverter, which is applicable to industrial application | <b>Analyse-(L4)</b>                     |
| CO5   | Students will be able to Evaluate, and develop suitable power electronic converter and inverter systems with different load.                                                                                | <b>Evaluate (L5)</b>                    |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs)                |       |       |     |     |             |             |     |     |      |      | PSOs |       |
|---------------------------|----------------------|-------|-------|-----|-----|-------------|-------------|-----|-----|------|------|------|-------|
|                           | PO1                  | PO2   | PO3   | PO4 | PO5 | PO6         | PO7         | PO8 | PO9 | PO10 | PO11 | PSO1 | PSO2  |
| Associate<br>WK Profiles  | WK<br>Associa<br>ted | WK1-4 | WK1-4 | WK5 | WK8 | WK2,<br>WK6 | WK1,5,<br>7 | WK9 | WK9 | WK9  | WK9  | WK8  | WK4-6 |
| CO1                       | 3                    | –     | –     | –   | 2   | –           | –           | –   | –   | –    | 1    | 3    | 2     |
| CO2                       | 3                    | 2     | –     | –   | 2   | –           | –           | –   | –   | –    | 1    | 3    | 2     |
| CO3                       | 3                    | 3     | 3     | 2   | 3   | –           | –           | –   | –   | –    | 2    | 3    | 3     |
| CO4                       | 3                    | 3     | 2     | 3   | 3   | –           | –           | –   | 2   | 2    | 2    | 3    | 3     |
| CO5                       | 3                    | 2     | 3     | 3   | 3   | –           | –           | –   | 2   | 2    | 2    | 3    | 3     |
| Average<br>Matrix         | 3                    | 2.5   | 2.7   | 2.7 | 2.6 | –           | –           | –   | 2   | 2    | 1.6  | 3    | 2.6   |

**Course- Electronics Design Lab**  
**Course Code: PCC -EE-310G**

| S.N0.      | Course Outcomes                                                                                                                                                                                                                                                                                                                      | RBT*-Revised Bloom's Taxonomy |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>CO1</b> | Students will be able to Recall the basic concepts of electronic measurements, sensors, signal conditioning circuits, electronic instrumentation, data acquisition systems, analog and digital system design, embedded systems, microcontrollers, CPLDs, FPGAs, PCB design, system assembly, and electronic hardware implementation. | <b>Recall (L1)</b>            |
| <b>CO2</b> | Students will be able to Understand the principles of measurements, noise reduction, sensors, signal conditioning, PC-based data acquisition, analog and digital interfacing, embedded systems, programmable devices, PCB design, system integration, and electronic hardware design methodologies.                                  | <b>Understand (L2)</b>        |
| <b>CO3</b> | Students will be able to Apply the knowledge of measurements, instrumentation, signal conditioning, data acquisition, analog and digital system design, embedded systems, microcontrollers, CPLDs/FPGAs, PCB design, and system assembly to perform laboratory experiments and develop electronic hardware prototypes.               | <b>Apply (L3)</b>             |
| <b>CO4</b> | Students will be able to Analyze the performance of electronic systems by interpreting experimental results, evaluating measurement accuracy, troubleshooting hardware and software interfaces, comparing analog and digital designs, and assessing embedded systems and PCB implementations.                                        | <b>Analyze (L4)</b>           |
| <b>CO5</b> | Students will be able to Design, implement, evaluate, and demonstrate an electronic hardware project by integrating analog, digital, mixed-signal, embedded systems, microcontrollers/CPLDs/FPGAs, PCB design, and data acquisition techniques while preparing technical documentation and presenting the project outcomes.          | <b>Evaluate(L5)</b>           |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcomes (Cos) | (POs) |       |      |     |          |         |     |      |     |      |      | PSOs  |          |
|-----------------------|-------|-------|------|-----|----------|---------|-----|------|-----|------|------|-------|----------|
|                       | PO1   | PO2   | PO3  | PO4 | PO5      | PO6     | PO7 | PO8  | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK         | WK1-4 | WK1-4 | WK5  | WK8 | WK2, WK6 | WK1,5,7 | WK9 | WK9  | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| <b>CO1</b>            | 3     | 2     | –    | –   | 2        | –       | –   | –    | –   | 1    | –    | 2     | 2        |
| <b>CO2</b>            | 3     | 3     | 2    | 2   | 3        | –       | –   | 1    | 1   | –    | 2    | 2     | 2        |
| <b>CO3</b>            | 3     | 3     | 3    | 3   | 3        | –       | –   | 1    | 1   | –    | 2    | 2     | 2        |
| <b>CO4</b>            | 3     | 3     | 3    | 3   | 3        | –       | –   | 2    | 1   | 1    | 2    | 2     | 2        |
| <b>CO5</b>            | 3     | 3     | 3    | 2   | 3        | –       | –   | 1    | 1   | 2    | 2    | 2     | 2        |
| <b>Average Matrix</b> | 3     | 2.8   | 2.75 | 2.5 | 2.8      |         |     | 1.25 | 1   | 1.3  | 2    | 2     | 2        |

**Course- ORGANIZATIONAL BEHAVIOUR**  
**Course Code: HSMC-02G**

| S.N0. | Course Outcomes                                                                                                                                                     | RBT*-Revised Bloom's Taxonomy/ |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | Students will be able to identify the principles of organizational behavior and the role of managers in effectively and efficiently managing individuals and teams. | Remember (L1)                  |
| CO2   | Students will be able to explain individual behaviour, attitudes, personality traits, motivation, leadership, and ethical practices in organizations.               | Interpret, (L2)                |
| CO3   | Students will be able to Apply conflict management techniques and organizational behavior principles to resolve interpersonal and organizational conflicts.         | Apply(L3)                      |
| CO4   | Students will be able to analyze organizational structure, culture, and behavioral practices to improve individual and organizational effectiveness.                | Analyze(L4)                    |
| CO5   | Students will be able to develop effective communication, leadership, teamwork, and administrative skills for professional and organizational success               | Develop (L6)                   |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |      |     |     |     |     |     |     |      |      |      | PSOs  |          |
|---------------------------|-------|------|-----|-----|-----|-----|-----|-----|------|------|------|-------|----------|
|                           | PO1   | PO2  | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9  | PO10 | PO11 | PSO1  | PSO2     |
| Associate<br>WK Profiles  | WK1-4 | WK2  | WK3 | WK4 | WK5 | WK6 | WK7 | WK7 | WK8  | WK9  | WK9  | WK4-6 | WK5, WK9 |
| CO1                       | 2     | -    | -   | -   | -   | -   | 2   | -   | -    | 1    | 2    | 1     | 1        |
| CO2                       | 2     | 2    | -   | -   | -   | -   | 3   | 2   | 2    | -    | 2    | 1     | 1        |
| CO3                       | 1     | 2    | 3   | 2   | -   | -   | 2   | 3   | 2    | 1    | 2    | 1     | 1        |
| CO4                       | 1     | 3    | 2   | 3   | -   | -   | 2   | 2   | 2    | 2    | 2    | 1     | 1        |
| CO5                       | -     | 2    | 3   | -   | -   | -   | 2   | 3   | 3    | 2    | 3    | 1     | 1        |
| Average<br>Matrix         | 1.5   | 2.25 | 2.7 | 2.5 |     |     | 2.2 | 2.5 | 2.25 | 1.5  | 2.2  | 1     | 1        |

**Course- Power Electronics Lab**

**Course Code: PCC-EE-308G**

| S.N0. | Course Outcomes                                                                                                                                                                                                                              | RBT*-Revised Bloom's Taxonomy |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to Identify the construction, specifications, functions, and safe operating procedures of power electronic laboratory instruments, components, and experimental hardware.                                              | Identify(L1)                  |
| CO2   | Students will be able to Explain the operating principles, characteristics, switching behavior, firing techniques, and speed-control concepts of power electronic devices, SCRs, converters, choppers, inverters, and motor-control systems. | Explain(L2)                   |
| CO3   | Students will be able to Perform power electronics laboratory experiments by correctly assembling experimental setups, connecting measuring instruments, and carrying out the required experimental procedures.                              | Perform(L3)                   |
| CO4   | Students will be able to Analyze experimental observations, record and interpret waveforms, and perform the required calculations to evaluate the performance of power electronic circuits.                                                  | Analyze(L4)                   |
| CO5   | Students will be able to Evaluate experimental results, maintain laboratory records, present experimental findings, and demonstrate understanding through viva-voce examinations.                                                            | Demonstrate(L5)               |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3     | –     | –   | –   | 3        | –        | -   | –   | –   | –    | –    | 3     | 2        |
| CO2                       | 3     | 3     | –   | –   | 2        | –        | –   | –   | –   | –    | –    | 3     | 3        |
| CO3                       | 2     | 2     | 3   | 3   | 3        | –        | -   | 2   | –   | –    | –    | 3     | 3        |
| CO4                       | 2     | 3     | –   | 3   | 2        | –        | –   | –   | 2   | –    | –    | 3     | 3        |
| CO5                       | –     | –     | –   | –   | 1        | –        | -   | 2   | 3   | 2    | 2    | 2     | 1        |
| Average Matrix            | 2.5   | 2.7   | 3.0 | 3.0 | 2.2      |          |     | 2.0 | 2.5 | 2.0  | 2.0  | 2.8   | 2.4      |

**Course- Power Systems– II**  
**Course Code: PCC-EE-302G**

| S.N0. | Course Outcomes                                                                                                                                                                                                                                 | RBT*-Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to Recall the fundamentals of power system operation, including power flow analysis, economic dispatch, voltage and frequency control, and power system stability.                                                        | Remember (L1)                 |
| CO2   | Students will be able to Apply bus admittance matrix formation, Gauss-Seidel and Newton-Raphson methods, economic load dispatch, and load frequency control techniques to solve power system operational problems.                              | Apply (L3)                    |
| CO3   | Students will be able to Analyze power flow solutions, economic operation considering transmission losses, automatic generation control, and power system stability under different operating conditions.                                       | Analyze-(L4)                  |
| CO4   | Students will be able to Evaluate the performance of power systems using optimal unit commitment, excitation systems, voltage control, load frequency control, and transient stability analysis techniques.                                     | Evaluate (L5)                 |
| CO5   | Students will be able to Recommend suitable operational and control strategies for secure, reliable, stable, and economical operation of interconnected power systems considering power flow, economic dispatch, AGC, and stability constraints | Create (L6)                   |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcomes (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|-----------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                       | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK         | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                   | 3     | 2     | –   | –   | 2        | –        | –   | –   | –   | –    | 1    | 3     | 2        |
| CO2                   | 3     | 3     | 2   | 2   | 3        | –        | –   | –   | –   | –    | 1    | 3     | 3        |
| CO3                   | 3     | 3     | 3   | 3   | 2        | –        | –   | –   | –   | 2    | 2    | 3     | 3        |
| CO4                   | 3     | 3     | 2   | 3   | 3        | –        | –   | –   | –   | 2    | 2    | 3     | 3        |
| CO5                   | 3     | 3     | 3   | 3   | 3        | –        | –   | –   | 2   | 2    | 2    | 2     | 3        |
| Average Matrix Value  | 3.0   | 2.8   | 2.5 | 2.8 | 2.6      |          |     |     | 2.0 | 2.0  | 1.6  | 2.8   | 2.8      |

**Course- Power Systems-II Lab**  
**Course Code: LC -EE-306G**

| S.NO.      | Course Outcomes                                                                                                                                                                                                                                          | RBT*-Revised Bloom's Taxonomy |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>CO1</b> | Student will be able to recall the functions, operating principles, specifications, and safe handling of various measuring instruments, laboratory equipment, used in Power system Labs.                                                                 | <b>Identify(L1)</b>           |
| <b>CO2</b> | Student will be able to understand the fundamental principles of photovoltaic modules, wind energy conversion systems, sequence reactance of alternators, power system faults, and the experimental procedures before performing laboratory experiments. | <b>Demonstrate(L2)</b>        |
| <b>CO3</b> | Student will be able to perform laboratory experiments by assembling the experimental setup, operating measuring instruments, software in power system lab                                                                                               | <b>Perform(L3)</b>            |
| <b>CO4</b> | Student will be able to analyze and evaluate the experimental observations by calculating electrical parameters of lab.                                                                                                                                  | <b>Analyze(L4)</b>            |
| <b>CO5</b> | Student will be able to prepare laboratory records with proper observations, calculations, graphs, and conclusions, maintain the practical file systematically, and effectively present and justify experimental results during viva-voce.               | <b>Evaluation (L5)</b>        |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos)   | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|-----------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                             | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK               | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| <b>CO1</b>                  | 3     | –     | –   | –   | 2        | –        | 2   | –   | –   | –    | 1    | 2     | 1        |
| <b>CO2</b>                  | 3     | 2     | –   | 2   | 2        | –        | –   | –   | –   | –    | –    | 2     | 3        |
| <b>CO3</b>                  | 2     | 3     | 2   | 3   | 3        | –        | –   | –   | 2   | –    | –    | 2     | 3        |
| <b>CO4</b>                  | 2     | 3     | –   | 3   | 2        | –        | –   | –   | –   | 1    | –    | 2     | 3        |
| <b>CO5</b>                  | 1     | 2     | –   | 2   | 1        | –        | 1   | 2   | 3   | 1    | 2    | 2     | 2        |
| <b>Average Matrix Value</b> | 2.2   | 2.5   | 2   | 2.5 | 2        |          | 1.5 | 2   | 2.5 | 1    | 1.5  | 2     | 2.4      |

**Course- Conventional and  
Renewable Energy Resources Course  
Code: OEC-EE-08G**

| S.N0. | Course Outcomes                                                                                                                                                                                                     | RBT*-Revised Bloom's      |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| CO1   | Student will be able to Recall various conventional and non-conventional energy sources, recent trends in power generation, and basic terms related to electric power generation                                    | <b>Remember ( L1 )</b>    |
| CO2   | Explain power generation planning concepts including load curves, load f Student will be able to orecasting, load factor, diversity factor, plant factor, capacity factor, reserves, cost of generation and tariff. | <b>Understand – (L2 )</b> |
| CO3   | Student will be able to Apply power generation principles to determine load requirements, unit size, and number of generating units, capacity and basic generation-related calculations.                            | <b>Apply(L3)</b>          |
| CO4   | Student will be able to Analyze the working, site selection, capacity and characteristics of conventional and non-conventional power generation systems.                                                            | <b>Analyze(L4)</b>        |
| CO5   | Student will be able to Evaluate and apply suitable power generation, energy conservation and management approaches considering energy efficiency, energy audit, efficient motors and co-generation.                | <b>Evaluate (L5)</b>      |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3     | 1     | –   | –   | –        | 1        | –   | –   | –   | –    | –    | 3     | 2        |
| CO2                       | 3     | 2     | –   | –   | –        | 2        | –   | –   | –   | –    | 2    | 3     | 2        |
| CO3                       | 3     | 3     | 2   | 2   | 2        | 2        | –   | –   | –   | –    | 2    | 3     | 3        |
| CO4                       | 3     | 3     | 3   | 3   | 2        | 3        | –   | –   | 1   | –    | –    | 3     | 3        |
| CO5                       | 3     | 3     | 3   | 2   | 3        | 3        | –   | 2   | 3   | 3    | 3    | 3     | 3        |
| Average Matrix            | 3.0   | 2.4   | 2.7 | 2.3 | 2.3      | 2.2      |     | 2.0 | 2.0 | 3.0  | 2.3  | 3.0   | 2.6      |

## B.Tech. EE 7<sup>th</sup> Semester

**Course- Electronic Principles**

**Course Code: OEC-EE-451G**

| S.NO. | Course Outcomes                                                                                                                                                                                                                                                         | RBT*-Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Student will be able to Recall the fundamentals of semiconductor materials, digital electronics, semiconductor devices (LED, Zener diode, BJT, UJT, MOSFET, Thyristor/SCR, DIAC and TRIAC), and display devices (LED, LCD, seven-segment and sixteen-segment displays). | Remember (L1)                 |
| CO2   | Student will be able to Explain the operating principles, characteristics, and applications of semiconductor devices, digital electronic circuits, Zener diode voltage regulators, power electronic devices, and display systems.                                       | Understand(L2)                |
| CO3   | Student will be able to Apply the principles of semiconductor devices, digital electronic circuits, diode circuits, power electronic devices, and display systems to solve basic electrical and electronic engineering problems.                                        | Apply(L3)                     |
| CO4   | Student will be able to Analyze the performance and characteristics of semiconductor devices, digital electronic circuits, voltage regulator circuits, power electronic devices, and display systems under different operating conditions.                              | Analyze(L4)                   |
| CO5   | Student will be able to Design basic electronic and digital circuits using semiconductor devices, power electronic devices, and display systems to meet specified functional requirements                                                                               | Design (L6)                   |

### CO- -PO-PSO Articulation Matrices with WK

| <b>Course Outcome s (Cos)</b> | <b>(POs)</b> |              |            |            |                 |                 |            |            |            |             |             | <b>PSOs</b>  |                 |
|-------------------------------|--------------|--------------|------------|------------|-----------------|-----------------|------------|------------|------------|-------------|-------------|--------------|-----------------|
|                               | <b>PO1</b>   | <b>PO2</b>   | <b>PO3</b> | <b>PO4</b> | <b>PO5</b>      | <b>PO6</b>      | <b>PO7</b> | <b>PO8</b> | <b>PO9</b> | <b>PO10</b> | <b>PO11</b> | <b>PSO1</b>  | <b>PSO2</b>     |
| <b>Associated WK</b>          | <b>WK1–4</b> | <b>WK1–4</b> | <b>WK5</b> | <b>WK8</b> | <b>WK2, WK6</b> | <b>WK1,5, 7</b> | <b>WK9</b> | <b>WK9</b> | <b>WK9</b> | <b>WK9</b>  | <b>WK8</b>  | <b>WK4–6</b> | <b>WK5, WK9</b> |
| <b>CO1</b>                    | 3            | 1            | –          | –          | 1               | –               | –          | –          | –          | –           | –           | 3            | 2               |
| <b>CO2</b>                    | 3            | 2            | 1          | 1          | 2               | –               | –          | –          | –          | –           | –           | 3            | 2               |
| <b>CO3</b>                    | 3            | 2            | 3          | 2          | 2               | –               | –          | –          | –          | –           | –           | 3            | 3               |
| <b>CO4</b>                    | 2            | 3            | 2          | 3          | 2               | –               | –          | –          | –          | –           | –           | 2            | 3               |
| <b>CO5</b>                    | 2            | 2            | 3          | 2          | 3               | –               | –          | –          | –          | –           | –           | 2            | 3               |
| <b>Average Matrix</b>         | 2.6          | 2.0          | 2.3        | 2.0        | 2.0             |                 |            |            |            |             |             | 2.6          | 2.6             |



**Course- Microcontroller Based System Design**  
**Course Code: PEC- EE-413G**

| S.NO. | Course Outcomes                                                                                                                                                                                                                                     | RBT*-Revised Bloom's Taxonomy/WK/PO/PSO |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| CO1   | Student will be able to Recall the architecture and features of PIC microcontrollers, interrupts, timers, peripheral interfacing, and ARM processors                                                                                                | Remember (L1)                           |
| CO2   | Student will be able to Explain the architecture and programming of PIC16C6X/PIC16C7X microcontrollers, loops, timers, subroutines, front panel interfacing, I <sup>2</sup> C bus, LCD interfacing, and ARM architecture.                           | Understand(L2)                          |
| CO3   | Student will be able to Apply PIC microcontroller programming, interrupts, timers, peripheral interfacing, I <sup>2</sup> C communication, LCD interfacing, and ARM processor concepts to develop embedded system applications.                     | Apply(L3)                               |
| CO4   | Student will be able to Analyze the operation and performance of PIC microcontroller-based systems, interrupt handling, timer functions, peripheral interfacing, communication protocols, and ARM processor architecture for embedded applications. | Analyze(L4)                             |
| CO5   | Student will be able to Design embedded system solutions using PIC microcontrollers, ARM processors, interrupts, timers, peripheral interfacing, I <sup>2</sup> C bus, and LCD modules to meet specified application requirements.                  | Design (L6)                             |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |      |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|------|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3  | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5  | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3     | 1     | –    | –   | 2        | –        | –   | –   | –   | –    | –    | 3     | 1        |
| CO2                       | 3     | 2     | 1    | 1   | 2        | –        | –   | –   | 1   | –    | –    | 3     | 1        |
| CO3                       | 3     | 3     | 3    | 2   | 3        | –        | –   | 1   | 1   | –    | 1    | 3     | 2        |
| CO4                       | 2     | 3     | 2    | 3   | 3        | –        | –   | 1   | 2   | –    | 1    | 3     | 2        |
| CO5                       | 2     | 3     | 3    | 2   | 3        | –        | –   | 1   | 1   | 1    | 2    | 3     | 3        |
| Average Matrix            | 2.6   | 2.4   | 2.25 | 2   | 2.6      |          |     | 1   | 1.3 | 1    | 1.3  | 3     | 1.8      |

**Course- Renewable energy and Distributed Generation**  
**Course Code: OEC-EE-403G**

| S.NO. | Course Outcomes                                                                                                                                                                                                                                | RBT*-Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Student will able to Recall the concepts of generating stations, energy sources, power electronic interfaces, transmission system operation and protection, and distributed generation economics.                                              | Remember ( L1 )               |
| CO2   | Student will able to Explain the operation and characteristics of generating stations, energy sources, power electronic interfaces, transmission systems, protection schemes, and distributed generation.                                      | Understand – (L2 )            |
| CO3   | Student will able to Apply the principles of power generation, transmission system operation, power electronic interfaces, and distributed generation in solving engineering problems.                                                         | Apply(L3)                     |
| CO4   | Student will able to Analyze and evaluate the performance of generating stations, transmission systems, protection schemes, power electronic interfaces, and distributed generation.                                                           | Analyze(L4)                   |
| CO5   | Students will be able to Evaluate suitable power system solutions incorporating generating stations, power electronic interfaces, transmission protection, and distributed generation for reliable and sustainable operation of power systems. | Evaluate (L5)                 |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3     | 1     | –   | –   | 1        | 1        | –   | –   | –   | 1    | 2    | 2     | 3        |
| CO2                       | 3     | 2     | 1   | 1   | 2        | 2        | 1   | 1   | 1   | 2    | 2    | 2     | 3        |
| CO3                       | 3     | 3     | 3   | 2   | 3        | 2        | 1   | 2   | 2   | 3    | 2    | 3     | 3        |
| CO4                       | 2     | 3     | 2   | 3   | 3        | 2        | 2   | 2   | 2   | 3    | 3    | 3     | 3        |
| CO5                       | 2     | 3     | 3   | 2   | 3        | 3        | 2   | 3   | 2   | 3    | 3    | 3     | 3        |
| Average Matrix            | 2.6   | 2.4   | 1.8 | 1.6 | 2.4      | 2        | 1.2 | 1.6 | 1.4 | 2.4  | 2.4  | 2.6   | 3        |

**Course- Project Stage-1**  
**Course Code: Proj-EE-423G**

| S.N0. | Course Outcomes                                                                                                                                                              | RBT*-Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Student will able to Conduct a comprehensive literature survey on the selected project topic and identify the research gap using relevant technical resources if any.        | Identify(L1)                  |
| CO2   | Student will able to Formulate the engineering problem by defining objectives, scope, constraints, and expected outcomes based on the literature review.                     | Formulate(L2)                 |
| CO3   | Student will able to Perform preliminary analysis, modeling, or feasibility study to evaluate possible approaches for solving the identified engineering problem.            | Analysis(L3)                  |
| CO4   | Student will able to Prepare a structured technical report documenting the literature review, problem formulation, methodology, and preliminary findings .                   | Create(L6)                    |
| CO5   | Student will able to Effectively present and defend the project proposal through a seminar by demonstrating technical knowledge, communication skills, and project planning. | Demonstrat(L5)                |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3     | 1     | –   | –   | 3        | –        | 2   | 2   | –   | –    | 3    | 2     | 2        |
| CO2                       | 3     | 3     | 3   | 2   | –        | 2        | –   | –   | –   | 2    | 2    | 3     | 2        |
| CO3                       | 3     | 3     | 3   | 3   | 3        | 2        | –   | 3   | –   | 2    | 2    | 3     | 3        |
| CO4                       | 2     | 2     | –   | 2   | 2        | –        | 2   | –   | 3   | 2    | 2    | 2     | 1        |
| CO5                       | 3     | –     | –   | 2   | 2        | 2        | 2   | –   | 3   | 3    | 2    | 3     | 2        |
| Average Matrix            | 2.8   | 2.3   | 3.0 | 2.3 | 2.5      | 2.0      | 2.0 | 2.5 | 3.0 | 2.3  | 2.2  | 2.6   | 2.0      |

**Course- Summer internship**  
**Course Code: INT-EE-425G**

| S.N0. | Course Outcomes                                                                                                                                                                                             | RBT*-Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to Recall the basic knowledge about Power Diode, Power MOSFET, SCR, IGBT, and Power Semiconductor Devices this is essential in concept building in Power electronics subject.         | <b>Remember (L1)</b>          |
| CO2   | Students will be able to Understand the, Conduction scheme of converter, choppers, commutation technique of SCR, Pulse transformer                                                                          | <b>Understand (L2)</b>        |
| CO3   | Students will be able to Apply the basic knowledge of Power Electronics Devices and construct chopper and Inverter circuit.                                                                                 | <b>Apply (L3)</b>             |
| CO4   | Students will be able to Analyze and Evaluate one, two, three, six and twelve pulse converts, force commutative converter, Modified McMurray bridge inverter, which is applicable to industrial application | <b>Analyze-(L4)</b>           |
| CO5   | Students will be able to Evaluate, and develop suitable power electronic converter and inverter systems with different load.                                                                                | <b>Evaluate (L5)</b>          |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3     | 2     | –   | –   | 2        | 1        | 2   | 2   | –   | –    | 1    | 2     | 2        |
| CO2                       | 3     | 3     | 2   | 2   | 3        | –        | –   | –   | –   | –    | 1    | 3     | 3        |
| CO3                       | 2     | 2     | –   | –   | 1        | –        | –   | –   | 3   | 3    | –    | 2     | 2        |
| CO4                       | 1     | 2     | –   | –   | 1        | –        | –   | –   | 3   | 3    | 2    | 2     | 2        |
| CO5                       | 2     | 2     | 1   | 1   | 2        | –        | 1   | 1   | 3   | 2    | 1    | 2     | 2        |
| Average Matrix            | 2.2   | 2.2   | 1.5 | 1.5 | 1.8      | 1.0      | 1.5 | 1.5 | 3.0 | 2.7  | 1.3  | 2.2   | 2.2      |

**Course- Power management**  
**Course Code: PEC-EE-401G**

| S.NO. | Course Outcomes                                                                                                                                                                                                                           | RBT*-Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to Recall the concepts of the present power scenario, energy resources, geophysical studies, contracting and procurement, organizational structure, economic management, and risk & hazard management.              | Remember (L1)                 |
| CO2   | Students will be able to Understand and explain the significance of the present power scenario, energy resources, organizational structure, procurement processes, economic management, and risk & hazard management in the power sector. | Understand (L2)               |
| CO3   | Students will be able to Apply the concepts of power sector planning, resource utilization, contracting, procurement, and economic management to solve practical engineering problems..                                                   | Apply (L3)                    |
| CO4   | Students will be able to Analyze power sector practices, energy resource utilization, contracting strategies, economic decisions, and risk & hazard management for effective decision-making.                                             | Analyze-(L4)                  |
| CO5   | Students will be able to develop sustainable strategies for power sector planning, resource management, procurement systems, and risk mitigation considering technical, economic, and environmental aspects                               | Create (L6)                   |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                        | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK          | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                    | 3     | 1     | –   | –   | –        | –        | 1   | –   | –   | 1    | 2    | 1     | 1        |
| CO2                    | 3     | 2     | 1   | –   | –        | 2        | 2   | –   | 2   | 2    | 2    | 2     | 2        |
| CO3                    | 3     | 3     | 2   | 2   | 2        | 2        | 1   | –   | 2   | 3    | 2    | 3     | 3        |
| CO4                    | 2     | 3     | 2   | 3   | –        | 2        | 2   | 2   | 3   | 3    | 2    | 2     | 3        |
| CO5                    | 2     | 3     | 3   | 2   | 2        | 3        | 1   | 2   | 2   | 3    | 3    | 3     | 3        |
| Average Matrix         | 2.6   | 2.4   | 2.0 | 2.3 | 2.0      | 2.3      | 1.4 | 2.0 | 2.3 | 2.4  | 2.2  | 2.2   | 2.4      |

**Course- Power management**  
**Course Code: PEC-EE-401G**

| S.N0. | Course Outcomes                                                                                                                                                                                              | RBT*-Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Student will able to Recall the fundamental concepts of EHV AC transmission, HVDC transmission, FACTS controllers, and power quality in modern power transmission systems.                                   | Remember (L1)                 |
| CO2   | Student will able to Explain the principles, characteristics, operation, and applications of EHV AC transmission, HVDC systems, FACTS controllers, and power quality improvement techniques.                 | Understand (L2)               |
| CO3   | Student will able to Analyze the performance of EHV AC transmission lines, HVDC converters, FACTS controllers, and power quality disturbances for efficient power transmission.                              | Analyze-(L4)                  |
| CO4   | Student will able to Evaluate the effectiveness of EHV AC, HVDC transmission, FACTS devices, and power quality mitigation techniques to improve the reliability, stability, and efficiency of power systems. | Evaluate(L5)                  |
| CO5   | Student will able to Design suitable transmission solutions by integrating EHV AC, HVDC transmission, FACTS controllers, and power quality enhancement techniques for modern power networks.                 | Create (L6)                   |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3     | –     | –   | –   | –        | –        | –   | –   | –   | –    | –    | 3     | 2        |
| CO2                       | 3     | 2     | –   | –   | –        | –        | –   | –   | –   | –    | –    | 3     | 2        |
| CO3                       | 3     | 3     | 2   | 3   | 2        | –        | –   | –   | –   | –    | –    | 3     | 3        |
| CO4                       | 3     | 3     | 3   | 3   | 3        | –        | –   | –   | –   | –    | –    | 3     | 3        |
| CO5                       | 3     | 3     | 3   | 3   | 3        | –        | –   | –   | –   | –    | 2    | 3     | 3        |
| Average Matrix            | 3.0   | 2.8   | 2.7 | 3.0 | 2.7      |          |     |     |     |      | 2.0  | 3.0   | 2.6      |

**Course- Fundamentals of Management**  
**Course Code: HSMC -08G**

| S.NO. | Course Outcomes                                                                                                                                                                                        | RBT*-Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to recall the basic concepts, definitions, characteristics, principles, and functions of management along with the development of management thoughts.                           | Remember (L1)                 |
| CO2   | Students will be able to explain the concepts of staffing, personnel management, manpower planning, recruitment, selection, promotion, and training processes for effective human resource management. | Understand (L2)               |
| CO3   | Students will be able to apply the concepts of production management, production planning and control, material management, and inventory control techniques for improving production efficiency.      | Apply (L3)                    |
| CO4   | Students will be able to analyze marketing concepts, marketing research methods, advertising objectives, functions, and their role in organizational decision-making. Analyze (L4)                     | Analyze-(L4)                  |
| CO5   | Students will be able to evaluate financial management concepts, objectives, functions, capital structure, and sources of finance for effective financial planning and decision-making.                | Create (L6)                   |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcomes (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|-----------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                       | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK         | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                   | 3     | 1     | –   | –   | –        | 2        | 2   | 2   | –   | –    | –    | 2     | –        |
| CO2                   | 3     | 2     | 2   | –   | –        | 2        | –   | 2   | –   | 2    | –    | 2     | 2        |
| CO3                   | 3     | 3     | 3   | 2   | 2        | 3        | –   | 2   | –   | 2    | 2    | 3     | 3        |
| CO4                   | 2     | 3     | 2   | 3   | 2        | 3        | 2   | 2   | –   | 3    | 2    | 2     | 3        |
| CO5                   | 3     | 3     | 3   | 2   | 2        | 3        | 2   | 2   | –   | 3    | 3    | 3     | 3        |
| Average Matrix        | 2.8   | 2.4   | 2.5 | 2.3 | 2.0      | 2.6      | 2.0 | 2.0 |     | 2.5  | 2.3  | 2.4   | 2.8      |

## EE 8th Semester

Course- General Proficiency

Course Code: GP-EE-426G

| S.N0. | Course Outcomes                                                                                                                                                                           | RBT*-Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to understand their academic performance and recognize the importance of continuous learning and knowledge enhancement                                              | Understand (L2)               |
| CO2   | Students will be able to participate in curricular and hostel activities to develop teamwork, communication skills, and social responsibility.                                            | Apply(L3)                     |
| CO3   | Students will be able to analyze their technical activities, industrial visits, educational tours, and professional memberships for enhancing technical knowledge and practical exposure. | Analyze(L4)                   |
| CO4   | Students will be able to develop personality traits through participation in sports and games activities by improving leadership, teamwork, and professional skills.                      | Create (L6)                   |
| CO5   | Students will be able to evaluate their overall performance through viva assessment and demonstrate technical knowledge, communication skills, and problem-solving ability.               | Evaluate(L5)                  |

### CO- -PO-PSO Articulation Matrices with WK

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 2     | 1     | –   | –   | –        | 2        | –   | 1   | 1   | 1    | 2    | 1     | –        |
| CO2                       | 1     | 1     | 2   | –   | –        | 2        | 2   | 2   | 3   | 2    | 1    | 1     | 1        |
| CO3                       | 2     | 2     | 2   | 2   | 1        | 2        | –   | 1   | 3   | 2    | 1    | 2     | 2        |
| CO4                       | 1     | 1     | 3   | 1   | –        | 3        | 2   | 2   | 3   | 2    | 1    | 2     | 2        |
| CO5                       | 2     | 2     | 2   | 2   | 1        | 2        | 2   | 2   | 3   | 2    | 1    | 2     | 2        |
| Average Matrix value      | 1.6   | 1.4   | 2.3 | 1.7 | 1.0      | 2.2      | 2.0 | 1.6 | 2.6 | 1.8  | 1.2  | 1.6   | 1.8      |



**Course- SOLAR ENERGY APPLIANCES****Course Code: OEC-EE-408-G**

| S.NO. | Course Outcomes                                                                                                                                                                                                   | RBT*-Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to Recall the fundamentals of solar energy, solar radiation, solar geometry, and the characteristics of solar thermal and photovoltaic energy system.                                       | Recall(L1)                    |
| CO2   | Students will be able to Explain the construction, working principles, and performance of various solar thermal appliances such as solar water heaters, solar cookers, solar dryers, and solar stills.            | Explain(L2)                   |
| CO3   | Students will be able to apply the operating principles, characteristics, and applications of solar photovoltaic (PV) systems, including PV cells, modules, arrays, batteries, charge controllers, and inverters. | Apply(L3)                     |
| CO4   | Students will be able to analyze standalone and grid-connected solar PV systems for domestic, commercial, and industrial applications considering energy requirements and system performance                      | Analyze(L4)                   |
| CO5   | Students will be able to Assess the techno-economic, environmental, and sustainability aspects of solar energy applications and recommend suitable solar energy solutions for real-world engineering problems.    | Evaluate(L5)                  |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3     | 1     | 1   | 1   | 1        | –        | –   | –   | –   | –    | –    | 2     | 2        |
| CO2                       | 3     | 2     | 1   | 2   | 2        | –        | –   | –   | –   | –    | –    | 3     | 2        |
| CO3                       | 3     | 3     | 2   | 2   | 2        | 1        | –   | –   | –   | 1    | 1    | 3     | 3        |
| CO4                       | 3     | 3     | 3   | 3   | 2        | 2        | –   | –   | 2   | 2    | 1    | 3     | 3        |
| CO5                       | 2     | 3     | 3   | 3   | 2        | 3        | 2   | 2   | 2   | 3    | 2    | 3     | 3        |
| Average Matrix value      | 2.8   | 2.4   | 2.0 | 2.2 | 1.8      | 2.0      | 2.0 | 2.0 | 2.0 | 2.0  | 1.3  | 2.8   | 2.6      |

**Course- Project stage-2**  
**Course Code: PROJ-EE-422G**

| S.N0. | Course Outcomes                                                                                                                                                                                                               | RBT*-Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to implement technical concepts and engineering knowledge for effective technical implementation by applying appropriate tools, methodologies, and resources to develop engineering solutions. stage-1. | Apply (L3)                    |
| CO2   | Students will be able to demonstrate innovation and originality by applying creative thinking, design approaches, and technical skills to develop improved and effective solutions.                                           | Create (L6)                   |
| CO3   | Students will be able to prepare a final report of quality by analyzing, documenting, and presenting technical work, project outcomes, and engineering findings systematically                                                | Analyze (L4)                  |
| CO4   | Students will be able to deliver an effective final presentation by demonstrating teamwork, communication skills, technical understanding, and professional presentation abilities                                            | Understand (L2)               |
| CO5   | Students will be able to evaluate and defend their work through viva voce by demonstrating technical knowledge, analytical ability, problem-solving skills, and effective communication.                                      | Evaluate (L5)                 |

**CO -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 1     | 1     | 2   | 2   | 3        | -        | -   | 1   | 2   | -    | 2    | 2     | 3        |
| CO2                       | 2     | 1     | 3   | 1   | 3        | -        | -   | 1   | 2   | 2    | 3    | 3     | 3        |
| CO3                       | 1     | 3     | 1   | 3   | 2        | 2        | -   | 2   | 3   | 2    | 2    | 2     | 2        |
| CO4                       | 3     | 2     | 2   | 2   | 3        | 1        | 2   | 1   | 3   | 1    | 2    | 3     | 3        |
| CO5                       | 1     | 1     | 1   | 1   | 2        | 2        | 2   | 2   | 3   | 1    | 2    | 3     | 2        |
| Average Matrix value      | 1.6   | 1.6   | 1.8 | 1.8 | 2.6      | 1.7      | 2.0 | 1.4 | 2.6 | 1.5  | 2.2  | 2.6   | 2.6      |

**Course- Special Electrical Machines**  
**Course Code: PEC-EE-402G**

| S.N0. | Course Outcomes                                                                                                                                                                                                                                                              | RBT*-Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Student will able to Recall the construction, operating principles, characteristics, and applications of poly-phase induction machines, single-phase machines, stepper motors, switched reluctance motors, permanent magnet machines, and other special electrical machines. | Recall(L1)                    |
| CO2   | Student will able to Explain the operating principles, rotating magnetic field concept, torque production, speed control methods, performance characteristics, and applications of special electrical machines..                                                             | Explain(L2)                   |
| CO3   | Student will able to Apply the principles of operation and performance analysis of induction motors, servo motors, stepper motors, switched reluctance motors, permanent magnet machines, and synchronous motors for engineering applications.                               | Apply(L)                      |
| CO4   | Student will able to Analyze the performance characteristics, speed control techniques, drive circuits, motoring, generating, and braking modes of various special electrical machines under different operating conditions.                                                 | Analyze(L4)                   |
| CO5   | Student will able to Evaluate and select suitable special electrical machines and control techniques for industrial, automation, and energy-efficient applications based on performance, reliability, and operational requirements.                                          | Evaluate(L5)                  |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | 3     | -     | -   | -   | -        | -        | -   | -   | -   | -    | -    | 3     | 2        |
| CO2                       | 3     | 2     | -   | -   | -        | -        | -   | -   | -   | -    | -    | 3     | 2        |
| CO3                       | 3     | 3     | 3   | 2   | 2        | -        | -   | -   | -   | -    | -    | 3     | 3        |
| CO4                       | 3     | 3     | 2   | 3   | 3        | -        | -   | -   | -   | -    | -    | 3     | 3        |
| CO5                       | 2     | 3     | 3   | 2   | 3        | -        | 2   | -   | -   | -    | 2    | 3     | 3        |
| Average Matrix value      | 2.8   | 2.8   | 2.7 | 2.3 | 2.7      |          | 2.0 |     |     |      | 2.0  | 3.0   | 2.6      |

Course- Seminar  
Course Code: SEM-EE-424G

| S.N0. | Course Outcomes                                                                                                                                                                                                          | RBT*-Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to demonstrate professionalism and ethical conduct in academic, personal, and professional environments.                                                                                           | Apply(L3)                     |
| CO2   | Students will be able to communicate effectively by applying appropriate verbal, written, and interpersonal communication skills.                                                                                        | Apply(L3)                     |
| CO3   | Students will be able to analyze their personal strengths, weaknesses, and overall development for continuous self-improvement.<br>L4 (Analyze)                                                                          | Analyze(L4)                   |
| CO4   | Students will be able to develop a positive attitude, professional outlook, responsiveness, and interpersonal qualities required for career and personal growth.                                                         | Create(L6)                    |
| CO5   | Students will be able to evaluate their performance and achievements in various academic, professional, and social activities to formulate strategies for lifelong learning and continuous improvement.<br>L5 (Evaluate) | Evaluate(L5)                  |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcome<br>s (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|---------------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                           | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK             | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                       | –     | –     | –   | –   | –        | –        | 3   | 3   | –   | –    | –    | –     | –        |
| CO2                       | –     | –     | –   | –   | –        | –        | –   | –   | 3   | 3    | –    | –     | –        |
| CO3                       | –     | –     | –   | –   | –        | –        | –   | –   | –   | 2    | 3    | –     | –        |
| CO4                       | –     | –     | –   | –   | –        | –        | –   | 3   | 2   | 3    | –    | –     | –        |
| CO5                       | –     | –     | –   | –   | –        | –        | –   | –   | –   | 2    | 3    | –     | –        |
| Average Matrix value      |       |       |     |     |          |          | 3.0 | 3.0 | 2.5 | 2.5  | 3.0  |       |          |

**Course- Solar Thermal Applications**  
**Course Code: OEC- EE-402G**

| S.NO. | Course Outcomes                                                                                                                                                                                                                                                                | RBT*-Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CO1   | Students will be able to Recall the fundamental concepts of solar radiation, heat transfer, solar thermal collectors, thermal energy storage systems, solar air heaters, greenhouse effect, and solar drying technologies                                                      | Recall(L1)                    |
| CO2   | Students will be able to Explain the principles, construction, characteristics, and performance of solar radiation systems, solar thermal collectors, thermal energy storage methods, solar air heaters, and greenhouse drying systems.                                        | Explain(L2)                   |
| CO3   | Students will be able to Apply the principles of solar radiation analysis, collector performance, thermal energy storage, and solar drying techniques to solve engineering problems in solar thermal applications.                                                             | Apply(L)                      |
| CO4   | Students will be able to Analyze the performance of solar thermal systems by evaluating solar radiation availability, collector efficiency, thermal energy storage techniques, and solar air heating and drying systems under different operating conditions                   | Analyze(L4)                   |
| CO5   | Students will be able to Evaluate and recommend suitable solar thermal technologies by integrating solar radiation, solar collectors, thermal energy storage, solar air heaters, and greenhouse drying systems for efficient, economical, and sustainable energy applications. | Evaluate(L5)                  |

**CO- -PO-PSO Articulation Matrices with WK**

| Course Outcomes (Cos) | (POs) |       |     |     |          |          |     |     |     |      |      | PSOs  |          |
|-----------------------|-------|-------|-----|-----|----------|----------|-----|-----|-----|------|------|-------|----------|
|                       | PO1   | PO2   | PO3 | PO4 | PO5      | PO6      | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1  | PSO2     |
| Associated WK         | WK1-4 | WK1-4 | WK5 | WK8 | WK2, WK6 | WK1,5, 7 | WK9 | WK9 | WK9 | WK9  | WK8  | WK4-6 | WK5, WK9 |
| CO1                   | 3     | –     | –   | –   | –        | –        | –   | –   | –   | –    | –    | –     | –        |
| CO2                   | 2     | –     | –   | –   | –        | –        | –   | –   | 3   | –    | –    | –     | –        |
| CO3                   | 2     | 3     | –   | 2   | –        | –        | –   | –   | –   | 2    | 3    | –     | –        |
| CO4                   | 2     | –     | –   | –   | –        | –        | –   | –   | 2   | 3    | –    | –     | –        |
| CO5                   | 2     | 3     | 3   | 2   | 2        | –        | –   | –   | –   | –    | 3    | 2     | 2        |
| Average Matrix value  | 2.2   | 3.0   | 3.0 | 2.0 | 2.0      |          |     |     | 2.5 | 2.5  | 3.0  | 2.0   | 2.0      |

**Program Outcomes (POs)**  
**Program Specific Outcomes (PSO)**  
**Course Outcomes (COs)**  
**&**  
**CO PO-PSO Articulation Matrices**



**Department of Electrical Engineering**  
**BRCM**  
**College of Engineering & Technology**

## **Program Outcomes (PO) as defined by NBA**

**Engineering Graduates will be able to:**

- 1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.**
- 2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.**
- 3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.**
- 4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.**
- 5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.**
- 6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.**
- 7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.**
- 8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.**

**9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.**

**10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.**

**11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.**

**12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.**

### **Program Specific Outcomes (PSO)**

**At the end of the program, the student**

**PSO1: Ability to utilize logical and technical skills to model, simulate and analyze electrical components and systems and Empowering to provide socially acceptable technical solutions to real time electrical engineering problems with the application of modern and appropriate techniques for sustainable development. n to complex Electrical engineering problems in generation, transmission and distribution of electrical power and its control. Also contribute for the development of smart power grid and integrating green energy on it to meet the increasing demand of the society.**

**PSO2: Able to provide socially acceptable technical solution to complex Electrical engineering problems in generation, transmission and distribution of electrical power and its control. Also contribute for the development of smart power grid and integrating green energy on it to meet the increasing demand of the society.**



## B.Tech. EE 3rd Semester

Course: Analog Electronics  
Course Code: PCC- EE-205G

| S.NO. | Course Outcomes                                                                                                                            | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | Students will be able to recall the basic knowledge of electronics devices.                                                                | L1<br>(Recall)                 |
| CO2   | Students will be able to understand and functioning and characteristics of transistor BJT,MOSFET OP-AMP                                    | L2<br>(Understand)             |
| CO3   | Student will be able to Apply the concept of operating mode of analog circuits.                                                            | L3<br>(Apply)                  |
| CO4   | Student will be able to analyze the OP-AMP based circuit and linear and non linear application of OP-AMP ,and MOSFET and BJT based circuit | L4<br>(Analyse)                |
| CO5   | Student will be able to design the Analog circuits using analog components.                                                                | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 2     | 1   | 0   |     |     |     |     |     |     |      |      | 1    | 3    | 2    |
| CO2                   | 3     | 1   |     |     |     |     |     |     | 2   |      |      |      | 3    | 3    |
| CO3                   | 2     | 3   |     |     |     | 2   |     |     |     |      |      |      | 3    | 3    |
| CO4                   | 2     |     |     |     |     |     |     |     |     | 3    |      | 3    | 2    | 2    |
| CO5                   | 2     | 1   |     |     | 3   |     | 1   |     |     |      |      | 2    | 2    | 3    |

Course-Electric Circuit Analysis  
Course Code: PCC- EE- 201G

| S.NO. | Course Outcomes                                                                                                                                                                                    | RBT*- Revised Bloom's Taxonomy |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall about DC Network AC Network and Network Theorems.                                                                                                                                        | L1<br>(Recall)                 |
| CO2   | To Understand Solution of First and Second order networks, Relationship between two port networks.                                                                                                 | L2<br>(Understand)             |
| CO3   | To Apply the Concept of Hurwitz polynomials, positive real functions. Properties of real immittance functions, Synthesis of LC driving point immittances, Synthesis of RC driving point impedances | L3<br>(Apply)                  |
| CO4   | To Analyze Electrical Circuit Using Laplace Transforms and Two Port Network and Network Functions and DC Network theorem                                                                           | L4<br>(Analyse)                |
| CO5   | To Evaluate different Electrical parameter of Network                                                                                                                                              | L5<br>(Evaluate)               |

CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   | 1   |     |     | 1   |     |     |     |      |      | 2    | 2    | 2    |
| CO2                   | 3     | 2   | 1   |     | 2   | 1   |     |     |     |      |      | 2    | 3    | 1    |
| CO3                   | 3     | 2   | 2   | 2   | 2   | 1   |     |     |     |      |      | 2    | 2    | 2    |
| CO4                   | 3     | 2   | 3   | 2   | 2   | 1   |     |     |     |      |      | 2    | 2    | 2    |
| CO5                   | 3     | 2   | 2   |     | 2   | 1   |     |     |     |      |      | 2    | 1    | 1    |

**Course-Electrical Machines-I**  
**Course Code: PCC-EE- 209G**

| S.NO. | Course Outcomes                                                                                                  | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the concept of magnetic circuit.                                                                       | L1<br>(Recall)                 |
| CO2   | To Understand the construction, principle of operation and performance of DC machine.                            | L2<br>(Understand)             |
| CO3   | To Analyze the difference in operation of different DC machine configurations and characteristics of DC machine. | L4<br>(Analyse)                |
| CO4   | To Evaluate the basic knowledge about motoring , generating and breaking mode of DC machine.                     | L5<br>(Evaluate)               |
| CO5   | To Design the single phase and three phase transformer circuit patameters                                        | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 2   |     |     |     |     |     |     |     |      |      |      | 3    | 1    |
| CO2                   | 3     | 3   | 1   | 2   |     |     |     |     |     |      |      |      | 2    | 3    |
| CO3                   | 3     | 2   | 2   | 3   |     |     |     |     |     |      |      |      | 3    | 2    |
| CO4                   | 3     | 3   | 2   | 3   | 1   |     |     |     |     |      |      | 2    | 2    | 1    |
| CO5                   | 3     | 2   | 2   | 2   | 1   |     |     |     |     |      |      | 2    | 2    | 2    |

**Course Code: PCC- EE- 210G**

| S.NO. | Course Outcomes                                                                                 | RBT*- Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge about the various measuring instruments.                          | L1<br>(Recall)                 |
| CO2   | To Explain the construction operating principal of different electronic devices.                | L2<br>(Understand)             |
| CO3   | To Analyses the performance of energy meter, wattmeter, power factor meter and frequency meter. | L3<br>(Apply)                  |
| CO4   | To Evaluate the static character of instruments.                                                | L4<br>(Analyse)                |
| CO5   | To Compare the measurement of parameter and variable with the help of AC and Dc bridges.        | L5<br>(Evaluate)               |

### CO PO-PSO Articulation Matrices

[illegible]

**Course-Engineering Mechanics**  
**Course Code: ESC-202-G**

| S.N0. | Course Outcomes                                                                             | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the concepts of Engineering Mechanics.                                            | L1<br>(Recall)                 |
| CO2   | To Understand the concepts of rigid bodies, vectors, tensors and co-ordinate systems.       | L2<br>(Understand)             |
| CO3   | To Apply knowledge to solve in to derive the various important terms related to rigid body. | L3<br>(Apply)                  |
| CO4   | To Analyze the various beams using different loading conditions and different support.      | L4<br>(Analyse)                |
| CO5   | To Evaluate problems related to the bending Moment, gyroscopes, rigid body and torsion.     | L5<br>(Evaluate)               |

### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 2   | 2   | 1   | 1   | 1   |     |     |     |      |      | 3    | 2    | 2    |
| CO2                   | 3     | 3   | 2   | 1   | 1   | 1   |     |     |     |      |      | 3    | 3    | 1    |
| CO3                   | 3     | 3   | 2   | 2   | 1   | 1   |     |     |     |      |      | 3    | 2    | 2    |
| CO4                   | 3     | 3   | 2   | 2   | 1   |     |     |     |     |      |      | 3    | 2    | 2    |
| CO5                   | 3     | 2   | 2   | 1   | 1   |     |     |     |     |      |      | 3    | 1    | 1    |

**Course-Environmental Studies**  
**Course Code: MC-GES-106-G**

| S.N0. | Course Outcomes                                               | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------|--------------------------------|
| CO1   | To Recall basic knowledge about environment.                  | L1<br>(Recall)                 |
| CO2   | To Illustrate environmental pollutants.                       | L2<br>(Understand)             |
| CO3   | To Discuss individual efforts toward healthy environment.     | L4<br>(Discuss)                |
| CO4   | To Analyse various activities contributing towards pollution. | L4<br>(Analyse)                |
| CO5   | To Evaluate various pollution control Methods.                | L5<br>(Evaluate)               |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     |     |     |     |     | 1   | 1   |     |     |      |      | 2    | 3    | 3    |
| CO2                   | 3     |     |     |     |     | 2   | 2   | 1   |     |      |      | 1    | 3    | 2    |
| CO3                   | 1     |     |     |     |     | 3   | 3   | 1   | 2   | 1    |      | 2    | 3    | 1    |
| CO4                   | 1     |     |     |     |     | 3   | 3   | 1   | 2   | 1    |      | 2    | 3    | 1    |
| CO5                   | 1     |     |     |     |     | 2   | 2   | 1   | 1   | 1    |      | 3    | 3    | 2    |

**Course-Electric Circuit Analysis Lab**  
**Course Code: PCC- EE-203G**

| S.N0. | Course Outcomes                                                                                               | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge about measuring instrument and kit.                                             | L1<br>(Recall)                 |
| CO2   | To Study circuit creation & simulation software like MATLAB and Transient response of RC, RL circuit.         | L2<br>(Study)                  |
| CO3   | To Analyze a network of a given network function and verify its response.                                     | L4<br>(Analyse)                |
| CO4   | To Verify Z" & "Y" ,"ABCD" parameters of a two port network, and Compensation theorem and Tellegen's theorem. | L5<br>(Verify)                 |
| CO5   | To Design a DC or AC Network Using Software or simulation tool (P-Spice or Matlab)                            | L6<br>(Simulation)             |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   | 1   |     |     | 1   |     |     |     |      |      | 2    | 2    | 2    |
| CO2                   | 3     | 2   | 1   |     | 2   | 1   |     |     |     |      |      | 2    | 3    | 1    |
| CO3                   | 3     | 2   | 2   | 2   | 2   | 1   |     |     |     |      |      | 2    | 2    | 2    |
| CO4                   | 3     | 2   | 3   | 2   | 2   | 1   |     |     |     |      |      | 2    | 2    | 2    |
| CO5                   | 3     | 2   | 2   |     | 2   | 1   |     |     |     |      |      | 2    | 1    | 1    |

**Course-Electrical Machines-I Lab****Course Code: PCC-EE-211G**

| S.N0. | Course Outcomes                                                        | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the various measuring instrument.                            | L1 (Recall)                    |
| CO2   | To Study and Measure the speed control of DC motor by methods.         | L2 (Study)                     |
| CO3   | To Apply the different methods for parallel operation of transformers. | L3 (Apply)                     |
| CO4   | To Evaluate different Performance test on transformer and DC machine.  | L5 (Evaluation)                |
| CO5   | To Compute and Plot various characteristics of DC Machine.             | L6 (Computing)                 |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   |     |     |     |     |     |     |     |      |      |      | 2    | 2    |
| CO2                   | 3     | 3   | 2   | 2   |     |     |     |     |     |      |      |      | 3    | 1    |
| CO3                   | 3     | 2   | 2   | 2   |     |     |     |     |     |      |      | 2    | 2    | 2    |
| CO4                   | 3     | 3   | 2   | 2   |     | 2   |     |     |     |      |      |      | 2    | 2    |
| CO5                   | 3     | 2   | 2   | 2   |     |     |     | 2   |     |      |      |      | 1    | 1    |



**Course-Analog Electronics Lab**  
**Course Code: PCC-EE-207G**

| S.NO. | Course Outcomes                                                                                                                            | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | Students will be able to recall the basic knowledge of electronics devices.                                                                | L1<br>(Recall)                 |
| CO2   | Students will be able to understand and functioning and characteristics of transistor BJT,MOSFET OP-AMP                                    | L2<br>(Illustrate)             |
| CO3   | Student will be able to Apply the concept of operating mode of analog circuits.                                                            | L3<br>(Apply)                  |
| CO4   | Student will be able to analyze the OP-AMP based circuit and linear and non linear application of OP-AMP ,and MOSFET and BJT based circuit | L4<br>(Analyse)                |
| CO5   | Student will be able to design the Analog circuits using analog components.                                                                | L6<br>(Design)                 |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     |     |     |     |     |     |     |     | 2   |      |      |      | 3    | 2    |
| CO2                   |       | 3   |     |     |     | 2   |     |     |     |      |      |      | 3    | 1    |
| CO3                   | 2     |     |     |     |     |     |     |     |     | 3    |      |      | 3    | 2    |
| CO4                   | 2     |     |     |     | 3   |     | 1   |     |     |      |      |      | 2    | 2    |
| CO5                   |       |     | 3   | 2   |     |     |     | 3   |     |      |      |      | 2    | 1    |

**Course - Measurement & Instrumentation Lab**  
**Course Code: PCC- EE- 212G**

| S.NO. | Course Outcomes                                                                   | RBT*- Revised Bloom's Taxonomy    |
|-------|-----------------------------------------------------------------------------------|-----------------------------------|
| CO1   | To Recall the basic knowledge about measuring instrument and laboratory equipment | L1<br>(Recall)                    |
| CO2   | To Understand the calibration of electronic devices.                              | L2<br>(Illustrate)                |
| CO3   | To Analyze the measurement of resistance by different methods                     | L4<br>(Analyse)                   |
| CO4   | To Evaluate the knowledge of different bridge.                                    | L5<br>(Evaluate)                  |
| CO5   | To Draw performance characteristics different transducer                          | L6<br>(Performance justification) |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 2     | 2   | 1   | 2   |     |     |     |     | 2   | 3    |      |      | 3    | 2    |
| CO2                   |       | 2   | 2   |     |     |     |     |     | 2   |      |      |      | 2    | 2    |
| CO3                   | 3     | 1   | 2   | 1   |     |     |     |     | 2   |      |      |      | 3    | 1    |
| CO4                   | 2     | 3   | 3   | 3   |     |     |     |     | 2   |      |      |      | 1    | 1    |
| CO5                   | 3     | 2   | 3   | 2   |     |     |     |     | 2   |      |      |      | 1    | 1    |

## B.Tech. EE 4th Semester

**Course: Biology for Engineers**  
**Course Code: BSC-BIO-201G**

| S.NO. | Course Outcomes                                                                          | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the concepts of Biology.                                                       | L1<br>(Recall)                 |
| CO2   | To Understand about living organisms, type of cells and microbes. .                      | L2<br>(Understand)             |
| CO3   | To Apply Bimolecular Applications of biotechnology in Agriculture, Medicine, Environment | L3<br>(Apply)                  |
| CO4   | To Analyse of Concept of genetic engineering                                             | L4<br>(Analyse)                |
| CO5   | To Interpret Economic importance of microbes and Concept of genetic code, Central Dogma  | L6<br>(Interpret)              |

### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 2     | 2   | 2   | 2   |     |     | 3   |     |     | 2    |      | 1    | 1    | 2    |
| CO2                   | 1     | 3   | 1   | 1   |     |     | 2   |     |     | 3    |      | 3    | 2    | 1    |
| CO3                   | 2     | 2   | 2   | 2   |     |     | 1   |     |     | 2    |      | 2    | 3    | 2    |
| CO4                   | 3     | 3   | 3   | 1   |     |     | 2   |     |     | 3    |      | 3    | 2    | 0    |
| CO5                   | 2     | 1   | 2   | 3   |     |     | 2   |     |     | 2    |      | 2    | 3    | 0    |

**Course: Constitution of India**  
**Course Code: MC-105G**

| S.NO. | Course Outcomes                                                                                                                                   | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the Meaning of the constitution law and constitutionalism.                                                                              | L1<br>(Recall)                 |
| CO2   | To Understand Historical perspective of the Constitution of India and Salient features and characteristics of the Constitution of India.          | L2<br>(Understand)             |
| CO3   | To Apply the scheme of the Fundamental Duties and its legal status, the Directive Principles of State Policy.                                     | L3<br>(Apply)                  |
| CO4   | To Analyse Federal structure and distribution of legislative and financial powers between the Union and the States.                               | L4<br>(Analyse)                |
| CO5   | To Descibe Emergency Provisions : National Emergency, President Rule, Financial Emergency, Local Self Government – Constitutional Scheme in India | L5<br>(Desccribe)              |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 2     | 2   | 1   | 1   |     |     |     | 1   | 2   | 1    |      |      | 3    | 2    |
| CO2                   | 1     | 2   | 2   | 3   |     |     |     | 2   | 1   | 2    |      |      | 1    | 1    |
| CO3                   | 3     | 1   | 1   | 2   |     |     |     | 2   | 3   | 2    |      |      | 2    | 3    |
| CO4                   | 1     | 3   | 2   | 1   |     |     |     | 1   | 2   | 3    |      |      | 2    | 2    |
| CO5                   | 3     | 1   | 1   | 2   |     |     |     | 2   | 1   | 2    |      |      | 3    | 1    |

**Course: Digital Electronic**  
**Course Code: PCC-EE-202G**

| S.NO. | Course Outcomes                                                                                                                                                                      | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the digital signal, positive and negative logic, Boolean algebra, logic gates, logical variables, truth table, number systems, codes, and their conversion from to others. | L1<br>(Recall)                 |
| CO2   | To Understand the minimization techniques to simply the hardware requirements for digital circuits                                                                                   | L2<br>(Understand)             |
| CO3   | To Apply the working mechanism and design guidelines of different combinational, sequential circuits and their role in the digital system design.                                    | L3<br>(Apply)                  |
| CO4   | To Analyze different types of digital electronic circuits using various mapping and mathematical methods.                                                                            | L4<br>(Analyse)                |
| CO5   | To Design the different type of components - ADC and DAC, Semiconductor Memories and Programmable Logic Devices.                                                                     | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

[illegible]

**Course: Electrical Machines-II**  
**Course Code: PCC-EE-206G**

| S.NO. | Course Outcomes                                                                              | RBT*- Revised Bloom's Taxonomy |
|-------|----------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the concept of rotating magnetic fields.                                           | L1<br>(Recall)                 |
| CO2   | To Explain the construction, principle of operation and performance of AC machine.           | L2<br>(Illustrate)             |
| CO3   | To Analyze performance characteristics of AC machine.                                        | L4<br>(Analyse)                |
| CO4   | To Evaluate the basic knowledge about motoring , generating and breaking mode of AC machine. | L5<br>(Determining)            |
| CO5   | To Compare the performance of induction and synchrouns machine.                              | L6<br>(Compare)                |

## CO PO-PSO Articulation Matrices

[illegible]

**Course: Electromagnetic Fields**  
**Course Code: PCC-EE-216G**

| S.NO. | Course Outcomes                                                                                                                | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the knowledge of vector calculus.                                                                                    | L1<br>(Recall)                 |
| CO2   | To Understand the basic laws of Electromagnetism.                                                                              | L2<br>(Understand)             |
| CO3   | To Applying the electromagnetism laws for obtain the electric magnetic fields for simple configuration under static condition. | L3<br>(Apply)                  |
| CO4   | To Analyze time varying electric and magnetic fields.                                                                          | L4<br>(Analyse)                |
| CO5   | To Evaluate the Maxwell equation in different form and different media to understand the propagation of EM waves.              | L5<br>(Evaluate)               |

### CO PO-PSO Articulation Matrices

[illegible]

**Course: Mathematics-III**  
**Course Code: BSC-MATH-204G**

| S.NO. | Course Outcomes                                                                                                                                                                                                            | RBT*- Revised Bloom's Taxonomy |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the mathematical tools needed in evaluating statistical data and find roots of polynomial.                                                                                                                       | L1 (Recall)                    |
| CO2   | To Understand how to find roots of polynomial and transcendental equations using numerical methods and solution the different type of numerical and statistical problem with the help of numerical methods and statistics. | L2 (Understand)                |
| CO3   | To Apply the statistical tools including measures of central tendency, correlation and solve problems involving random variables and numerical analysis.                                                                   | L3 (Apply)                     |
| CO4   | To Analyse the statistical methods of studying data samples and solution of numerical problems.                                                                                                                            | L4 (Analyse)                   |
| CO5   | To Evaluate/Solve different type of differentiation and integration in numerical method and problems related to statistics (Hypothesis testing).                                                                           | L5 (Evaluate)                  |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 2   | 1   | 3   |     |     |     | 3   | 3   | 1    |      |      | 2    | 1    |
| CO2                   | 2     | 1   | 2   | 1   |     |     |     | 1   | 2   | 3    |      |      | 3    | 2    |
| CO3                   | 3     | 3   | 1   | 2   |     |     |     | 2   | 3   | 2    |      |      | 2    | 3    |
| CO4                   | 3     | 2   | 3   | 1   |     |     |     | 2   | 3   | 3    |      |      | 3    | 2    |
| CO5                   | 3     | 2   | 2   | 2   |     |     |     | 2   | 2   | 2    |      |      | 3    | 3    |



**Course: Signals and System**  
**Course Code: PCC-EE-214G**

| S.NO. | Course Outcomes                                                                                                                                | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic concept of various signals with their mathematical description and representation of continuous and discrete time signals. | L1<br>(Recall)                 |
| CO2   | To Understand the knowledge about the input output relationship for different systems.                                                         | L2<br>(Understand)             |
| CO3   | To Apply the knowledge of different mathematical tools ( F.T,DTFT,LT and ZT) to resolve the signal in frequency domain .                       | L3<br>(Apply)                  |
| CO4   | To Analyze the limitations and application of different tools in C.T. & D.T. signals and system.                                               | L4<br>(Analyse)                |
| CO5   | To Design the first and second order system filters.                                                                                           | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

[illegible]

**Course: Transmission and Distribution**  
**Course Code: PCC- EE-210G**

| S.NO. | Course Outcomes                                                                                            | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge about the structure and present day scenario of a power system.              | L1<br>(Recall)                 |
| CO2   | To Explain the mechanical design of transmission line with skin effect and proximity effect.               | L2<br>(Explain)                |
| CO3   | To Analyses the performance of transmission line as well as transmission and distribution lines parameter. | L4<br>(Analyse)                |
| CO4   | To Evaluate and compare various cables and insulator grading as well as rating.                            | L5<br>(Evaluate)               |
| CO5   | To Design a proper transmission and distribution structure of a power system.                              | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

[illegible]



**Course: Electrical machine-2 Lab**  
**Course Code: PCC-EE-208G**

| S.NO. | Course Outcomes                                                                                                                                                                             | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the various measuring instrument                                                                                                                                                  | L1<br>(Recall)                 |
| CO2   | To Study and Measure the speed control of induction motor by rotor resistance control.8. Study of Power (Load) sharing between two Three Phase alternators in parallel operation Condition. | L2<br>(Understand)             |
| CO3   | To Apply the different methods for Synchronization of two Three Phase Alternators                                                                                                           | L3<br>(Apply)                  |
| CO4   | To Evaluate different Performance test on synchronous generator and Induction motor                                                                                                         | L4<br>(Analyse)                |
| CO5   | To Compute and Plot varioue characteristics of Machine                                                                                                                                      | L5<br>(Evaluate)               |

### CO PO-PSO Articulation Matrices

[illegible]



## B.Tech. EE 5th Semester

**Course: Electrical Drives**  
**Course Code: PEC-EE-03G**

| S.NO. | Course Outcomes                                                                   | RBT*- Revised Bloom's Taxonomy |
|-------|-----------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge of electric drives                                  | L1<br>(Recall)                 |
| CO2   | To Understand the basic of multi-quadrant operation of DC drives                  | L2<br>(Understand)             |
| CO3   | To Analysis the characteristic of Dc motor induction motor.                       | L4<br>(Analyse)                |
| CO4   | To Evaluate the principles of speed control of Dc motor and induction motor.      | L5<br>(Evaluate)               |
| CO5   | To Devolve the power electronic converter used for induction motor speed control. | L6<br>(Design)                 |

## CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     |     |     |     |     |     | 1   |     | 2   |      | 2    |      | 1    | 1    |
| CO2                   | 3     | 3   | 2   | 2   |     |     |     |     | 3   |      |      | 1    | 2    | 2    |
| CO3                   | 3     | 3   | 1   | 3   |     |     |     |     |     |      |      | 1    | 2    | 2    |
| CO4                   | 3     | 3   | 3   | 2   |     |     |     |     | 2   |      | 1    | 1    | 3    | 1    |
| CO5                   | 3     |     | 3   |     | 2   |     |     |     |     |      |      | 1    | 3    | 3    |

**Course: Economics for Engineers**  
**Course Code: HSMC-01G**

| S.N0. | Course Outcomes                                                                                                            | RBT*- Revised Bloom's Taxonomy |
|-------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Describe the Basics of Economic Theories terminology, Cost concepts and Pricing Policies Used in Engineering Economics. | L1<br>(Recall)                 |
| CO2   | To Summarize the measures of national income, the functions of banks and concepts of globalization                         | L2<br>(Understand)             |
| CO3   | To Discuss how supply and demand change when a product's price changes                                                     | L4<br>(Analyse)                |
| CO4   | To Use the Concept of Demand to explain the Outcomes of markets for individuals firms and society                          | L5<br>(Evaluate)               |
| CO5   | To Analyze how a change in price and income affects the behaviour of buyers and sellers.                                   | L4<br>(Analyse)                |

### CO PO-PSO Articulation Matrices

| <b>Course Outcomes (Cos)</b> | <b>(POs)</b> |            |            |            |            |            |            |            |            |             |             |             | <b>PSOs</b> |             |
|------------------------------|--------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|
|                              | <b>PO1</b>   | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> | <b>PO7</b> | <b>PO8</b> | <b>PO9</b> | <b>PO10</b> | <b>PO11</b> | <b>PO12</b> | <b>PSO1</b> | <b>PSO2</b> |
| <b>CO1</b>                   |              |            |            |            |            |            |            |            |            |             |             |             | <b>1</b>    | <b>1</b>    |
| <b>CO2</b>                   | <b>3</b>     |            |            |            |            |            |            |            |            |             |             |             | <b>2</b>    | <b>1</b>    |
| <b>CO3</b>                   |              | <b>3</b>   | <b>2</b>   |            |            |            |            |            |            |             |             |             | <b>3</b>    | <b>3</b>    |
| <b>CO4</b>                   | <b>2</b>     | <b>3</b>   |            | <b>2</b>   |            |            |            |            |            |             |             |             | <b>2</b>    | <b>2</b>    |
| <b>CO5</b>                   | <b>3</b>     |            | <b>2</b>   | <b>2</b>   |            |            |            |            |            |             |             |             | <b>2</b>    | <b>1</b>    |

**Course: Microprocessor& Microcontroller**  
**Course Code: PCC-EE-309G**

| S.N0. | Course outcomes                                                                                                                                         | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge of microprocessor and microcontroller.                                                                                    | L1<br>(Recall)                 |
| CO2   | To Understand the construction, principle of operation and pin configuration and architecture of microprocessor ,microcontroller and peripheral devices | L2<br>Understand               |
| CO3   | To Write the programming by the understanding of instruction sets of microprocessor and microcontroller.                                                | L2<br>(Define and understand)  |
| CO4   | To Analyze the interfacing of microcontroller and peripheral devices                                                                                    | L4<br>(Analyse)                |
| CO5   | To Design the programming machines using microprocessor and microcontroller                                                                             | L6<br>(Design)                 |

#### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   |       |     |     |     |     |     |     |     | 3   |      |      |      | 3    | 2    |
| CO2                   | 2     | 2   | 3   | 3   | 3   |     |     |     |     |      |      |      | 3    | 3    |
| CO3                   | 2     |     | 3   | 3   | 3   |     |     |     |     |      |      |      | 2    | 2    |
| CO4                   |       |     | 3   | 3   |     |     |     |     |     | 2    |      |      | 3    | 3    |
| CO5                   | 3     | 3   | 2   |     | 2   | 2   |     |     |     | 2    |      | 3    | 3    | 3    |



**Course: Power system-1**  
**Course Code: PCC-EE-301G**

| S.NO. | Course Outcomes                                                                 | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall basic concept of power system structure.                              | L1<br>(Recall)                 |
| CO2   | To Explain the various power system components.                                 | L2<br>(Illustrate)             |
| CO3   | To Use the basic knowledge of protection schemes and circuit breaker.           | L2<br>(Define and understand)  |
| CO4   | To Analyze fault current for different current fault.                           | L4<br>(Analyse)                |
| CO5   | To Evaluate concept of HVDC power transmission and renewable energy generation. | L5<br>(Evaluate)               |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 3   |     | 2   | 2   |     |     |     | 2   | 2    |      | 2    | 3    | 2    |
| CO2                   | 3     | 3   | 3   | 2   | 3   |     |     |     | 2   | 2    |      | 2    | 3    | 1    |
| CO3                   | 3     | 3   | 3   | 2   | 3   |     |     |     | 2   | 2    |      | 2    | 2    | 2    |
| CO4                   | 3     | 3   | 3   | 2   | 3   |     |     |     | 2   | 2    |      | 2    | 3    | 1    |
| CO5                   | 3     | 3   | 3   | 2   | 3   |     |     |     |     | 2    |      | 2    | 3    | 3    |

**Course: Computer Aided Electrical Machine Design**  
**Course Code: PCC-EE-313G**

| S.NO. | Course Outcomes                                                                                                                                | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Remember the basic parameter of Electrical Machine and its features and limitations                                                         | L1<br>(Remember)               |
| CO2   | To Understand complete detailed design of all static and rotating Machines and the specified limits for Specific electric and magnetic loading | L2<br>(Understand)             |
| CO3   | To Analyze Operating characteristics of Electrical Machine.                                                                                    | L4<br>(Analyse)                |
| CO4   | To Evaluate different design parameter of all static and rotating Machines.                                                                    | L5<br>(Evaluate)               |
| CO5   | To Synthesize efficient algorithm and make a flow chart for all static and rotating machine                                                    | L6<br>(Synthesize)             |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   | 1   | 2   | 1   |     |     |     |     |      |      |      | 3    | 1    |
| CO2                   | 3     | 2   | 2   | 2   | 2   |     |     |     |     |      |      |      | 3    | 3    |
| CO3                   | 3     | 3   | 2   | 2   | 2   |     |     |     |     |      |      |      | 2    | 2    |
| CO4                   | 3     | 1   | 2   | 2   | 2   |     |     |     |     |      |      |      | 3    | 3    |
| CO5                   | 3     | 1   | 3   | 1   | 1   | 2   | 2   | 1   | 2   | 1    | 1    | 2    | 3    | 2    |

**Course: Control System**  
**Course Code: PCC-EE-305G**

| S.NO. | Course Outcomes                                                          | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge of system transfer function.               | L1<br>(Recall)                 |
| CO2   | To Understand the, knowledge of time and frequency systems.              | L2<br>(Understand)             |
| CO3   | To Apply the basic knowledge state space reparation.                     | L3<br>(Apply)                  |
| CO4   | To Analyze the concept of satiability and its assessment for LTI system. | L4<br>(Analyse)                |
| CO5   | To Design simple feedback controller                                     | L6<br>(Design)                 |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 3   |     | 2   | 2   |     |     |     | 2   | 2    |      | 2    | 3    | 2    |
| CO2                   | 3     | 3   | 3   | 2   | 3   |     |     |     | 2   | 2    |      | 2    | 3    | 1    |
| CO3                   | 3     | 3   | 3   | 2   | 3   |     |     |     | 2   | 2    |      | 2    | 2    | 2    |
| CO4                   | 3     | 3   | 3   | 2   | 3   |     |     |     | 2   | 2    |      | 2    | 3    | 1    |
| CO5                   | 3     | 3   | 3   | 2   | 3   |     |     |     |     | 2    |      | 2    | 3    | 3    |

**Course: Control System Lab**  
**Course Code: LC-EE-307G**

| S.N0. | Course Outcomes                                                                                                           | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | Recall the various measuring instrument.                                                                                  | L1<br>(Recall)                 |
| CO2   | To Understand the, open loop system and close loop system.                                                                | L2<br>(Understand)             |
| CO3   | To Apply the basic knowledge of control action in different device like, industrial PLC control, light intensity control. | L3<br>(Apply)                  |
| CO4   | To Analyze and Evaluate in PID controller                                                                                 | L4<br>(Analyse)                |
| CO5   | To Design the pole –zero configuration in s-plane for the transfer function.                                              | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 2     | 2   |     |     |     |     |     |     |     |      |      | 1    | 3    | 1    |
| CO2                   | 2     | 2   |     |     |     |     |     |     |     |      |      | 1    | 3    | 1    |
| CO3                   | 2     | 2   |     |     |     |     |     |     |     |      |      | 1    | 2    | 0    |
| CO4                   | 2     | 2   |     | 2   |     |     |     |     |     |      |      | 1    | 3    | 1    |
| CO5                   | 2     | 2   |     | 2   |     |     |     |     |     |      |      | 1    | 3    | 1    |

**Course: Computer Aided Electrical Lab**  
**Course Code: LC-EE-315G**

| S.N0. | Course Outcomes                                                                                                  | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall about metlab software.                                                                                 | L1<br>(Recall)                 |
| CO2   | To Write a program to measure the main dimension of an induction motor, synchronous motor                        | L3<br>(Apply)                  |
| CO3   | To Write a program to measure the core and yoke design of transformer                                            | L3<br>(Apply)                  |
| CO4   | To Evaluate main dimension of an induction motor, synchronous motor and DC machine. .                            | L5<br>(Evaluate)               |
| CO5   | To Evaluate main dimension of an induction motor, synchronous motor and DC machine. Transformer using simulation | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

[illegible]

**Course: Microprocessor& Microcontroller Lab**  
**Course Code: LC-EE-311G**

| S.NO. | Course Outcomes                                                                                                           | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the various measuring instrument.                                                                               | L1<br>(Recall)                 |
| CO2   | To Understand the, open loop system and close loop system.                                                                | L2<br>(Understand)             |
| CO3   | To Apply the basic knowledge of control action in different device like, industrial PLC control, light intensity control. | L3<br>(Apply)                  |
| CO4   | To Analyze and Evaluate in PID controller                                                                                 | L4<br>(Analyse)                |
| CO5   | To Design the pole –zero configuration in s-plane for the transfer function.                                              | L6<br>(Design)                 |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   |       | 2   |     |     | 2   |     |     |     |     |      |      |      | 1    | 3    |
| CO2                   | 2     | 3   |     | 2   | 2   |     |     |     |     |      |      |      | 3    | 2    |
| CO3                   | 2     |     |     |     | 2   |     |     |     |     | 3    |      |      | 2    | 1    |
| CO4                   | 2     |     |     | 2   | 2   |     | 3   |     |     | 3    |      |      | 1    | 1    |
| CO5                   |       | 2   |     |     |     |     | 2   |     |     | 2    |      |      | 3    | 1    |

**Course: Power Systems–I Lab**  
**Course Code: LC-EE-303G**

| S.N0. | Course Outcomes                                                                                                  | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall about metlab software.                                                                                 | L1<br>(Recall)                 |
| CO2   | To Write a program to measure the main dimension of an induction motor, synchronous motor                        | L2<br>(Understand)             |
| CO3   | To Write a program to measure the core and yoke design of transformer                                            | L4<br>(Analyse)                |
| CO4   | To Evaluate main dimension of an induction motor, synchronous motor and DC machine. .                            | L5<br>(Evaluate)               |
| CO5   | To Evaluate main dimension of an induction motor, synchronous motor and DC machine. Transformer using simulation | L6<br>(Simulation)             |

### CO PO-PSO Articulation Matrices

[illegible]

**Course: Power plant engineering**  
**Course Code: OEC-EE-07G**

| S.NO. | Course Outcomes                                                                                                                                                                                                                                                            | RBT*- Revised Bloom's Taxonomy |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | Analyze the Structure of materials, imperfection and diffusion mechanism                                                                                                                                                                                                   | L4<br>(Analyse)                |
| CO2   | Interpret the deformation of materials and Illustrate concept of mechanical failure of materials (Fracture, Fatigue and creep).                                                                                                                                            | L2<br>(Illustrate)             |
| CO3   | Define the concept of phase & phase diagram & understand the basic terminologies associated with metallurgy. Label, construction and identification of phase diagrams and reactions.                                                                                       | L2<br>(Understand)             |
| CO4   | Importance of the heat treatment process & types along with concluding significance of properties of microstructure materials. Determining surface hardening phenomenon & its types, concept of hardenability & demonstrate the test used to find hardenability of steels. | L5<br>(Determining)            |
| CO5   | Identify Plain Carbon steels on the basis of properties & uses, effect of alloying elements and choose wear resisting steels for specific applications.                                                                                                                    | L 6<br>(Inentify)              |

### CO PO-PSO Articulation Matrices

| <b>Course Outcomes<br/>(Cos)</b> | <b>(POs)</b> |            |            |            |            |            |            |            |            |             |             |             | <b>PSOs</b> |             |
|----------------------------------|--------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|
|                                  | <b>PO1</b>   | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> | <b>PO7</b> | <b>PO8</b> | <b>PO9</b> | <b>PO10</b> | <b>PO11</b> | <b>PO12</b> | <b>PSO1</b> | <b>PSO2</b> |
| <b>CO1</b>                       | <b>3</b>     |            |            |            |            |            |            |            |            |             |             |             | <b>1</b>    | <b>1</b>    |
| <b>CO2</b>                       |              | <b>3</b>   | <b>2</b>   |            |            |            |            |            |            |             |             |             | <b>2</b>    | <b>2</b>    |
| <b>CO3</b>                       | <b>2</b>     | <b>3</b>   |            | <b>2</b>   |            |            |            |            |            |             |             |             | <b>2</b>    | <b>2</b>    |
| <b>CO4</b>                       | <b>3</b>     |            | <b>2</b>   | <b>2</b>   |            |            |            |            |            |             |             |             | <b>2</b>    | <b>1</b>    |
| <b>CO5</b>                       | <b>3</b>     | <b>2</b>   |            |            | <b>2</b>   |            |            |            |            |             |             |             | <b>2</b>    | <b>2</b>    |



**Course: Practical training-1**  
**Course: PT-EE-317G**

| S.NO. | Course Outcomes                                                                                            | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | Participate in the projects in industries during his or her industrial training.                           | L3<br>(Participate)            |
| CO2   | Describe use of advanced tools and techniques encountered during industrial training and visit             | L5<br>(Describe)               |
| CO3   | Interact with industrial personnel and follow engineering practices and discipline prescribed in industry. | L4<br>(Interaction)            |
| CO4   | Develop awareness about general workplace behavior and build interpersonal and team skills                 | L4<br>(Analyse)                |
| CO5   | Prepare professional work reports and presentations..                                                      | L6<br>(Report)                 |

#### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 1     | 1   | 1   |     | 2   | 0   | 2   | 0   | 2   | 1    | 1    | 2    | 1    | 3    |
| CO2                   | 1     | 1   | 1   | 1   |     |     | 2   | 2   | 2   | 2    | 1    | 2    | 2    | 2    |
| CO3                   | 1     | 1   | 1   | 1   | 2   | 0   | 2   | 2   | 2   | 2    | 1    | 1    | 2    | 2    |
| CO4                   | 1     | 1   | 1   | 1   | 2   |     | 2   | 2   | 1   | 2    | 1    | 2    | 2    | 2    |
| CO5                   | 1     | 1   | 1   |     | 2   | 0   | 2   | 2   | 2   | 2    | 2    | 3    | 2    | 2    |

## B.Tech. EE 6th Semester

Course: Advance Electric Drives

Course Code: PEC-EE-18G

| S.NO. | Course Outcomes                                                                               | RBT*- Revised Bloom's Taxonomy |
|-------|-----------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the concept of electric drives.                                                     | L1<br>(Recall)                 |
| CO2   | To Understand the concept of electric drives. And concept of DSP based motion control drives. | L2<br>(Understand)             |
| CO3   | To Apply principle of operation and performance of electric drives                            | L3<br>(Apply)                  |
| CO4   | To Analyze performance characteristics of multi quadrant drives                               | L4<br>(Analyse)                |
| CO5   | To Evaluate the basic knowledge about motoring, generating and breaking mode of AC machine.   | L5<br>(Evaluate)               |

### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 1     | 1   | 1   | 2   | 2   | 1   |     |     |     |      |      | 1    | 2    | 2    |
| CO2                   | 2     | 2   | 2   | 1   | 3   | 2   |     |     |     |      |      |      | 3    | 1    |
| CO3                   | 3     | 1   | 1   | 3   | 1   | 3   |     |     |     |      |      |      | 2    | 2    |
| CO4                   | 2     |     | 2   | 2   | 2   | 2   |     |     |     |      |      |      | 2    | 1    |
| CO5                   | 1     | 3   | 1   | 1   | 1   | 2   | 2   | 3   | 2   | 1    | 1    | 2    | 3    | 3    |

**Course: Digital Signal Processing**  
**Course Code: PEC-EE-04G**

| S.NO. | Course Outcomes                                                                                                 | RBT*- Revised Bloom's Taxonomy |
|-------|-----------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge of digital signal and processing system                                           | L1<br>(Recall)                 |
| CO2   | To Understand the basic the like sampling, interpolation, aliasing and operations, convolution and correlation. | L2<br>(Understand)             |
| CO3   | To mathematical Analysis and application of DFT & FFT.                                                          | L4<br>(Analyse)                |
| CO4   | To Evaluate practical knowledge of signal processing operation by using software.                               | L5<br>(Evaluate)               |
| CO5   | To Design implementation of digital filter.                                                                     | L6<br>(Design)                 |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   | 3   | 3   | 1   |     |     |     |     |      |      |      | 3    | 1    |
| CO2                   | 2     | 2   | 1   | 1   | 2   | 1   |     |     |     |      |      |      | 1    | 3    |
| CO3                   | 1     | 3   | 3   | 2   | 3   |     |     |     |     |      |      |      | 2    | 2    |
| CO4                   | 2     | 2   | 2   | 2   | 2   |     |     |     |     |      |      |      | 2    | 1    |
| CO5                   | 1     | 1   | 3   | 1   | 1   | 2   | 2   | 2   | 3   | 1    | 1    | 2    | 2    | 3    |

Course: Power Electronics  
Course Code: PCC-EE-306G

| S.NO. | Course Outcomes                                                                                                                                                                                                             | RBT*- Revised Bloom's Taxonomy |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge about Power Diode, Power MOSFET, SCR, IGBT, and Power Semiconductor Devices this is essential in concept building in Power electronics subject.                                               | L1<br>(Recall)                 |
| CO2   | To Understand the, Conduction scheme of converter, choppers, commutation technique of SCR, Pulse transformer                                                                                                                | L2<br>(Illustrate)             |
| CO3   | To Apply the basic knowledge of Power Electronics Devices and construct chopper and Inverter circuit.                                                                                                                       | L3<br>(Apply)                  |
| CO4   | To Analyze and Evaluate one, two, three, six and twelve pulse converts, force commutative converter, Modified McMurray bridge inverter, which is applicable to industrial application                                       | L4<br>(Analyse)                |
| CO5   | To Design various switching, protection circuit and drive circuits Inverter, and Chopper circuit with R- Load and Highly inductive load. Step-up chopper for control of various power switches; Phase controlled rectifier, | L6<br>(Design)                 |

#### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 1     | 1   | 1   | 2   | 1   |     |     |     |     |      |      | 1    | 3    | 2    |
| CO2                   | 2     | 1   | 2   | 3   | 2   |     |     |     |     |      |      |      | 3    | 3    |
| CO3                   | 3     | 2   | 2   | 2   | 3   |     |     |     |     |      |      |      | 1    | 3    |
| CO4                   | 1     | 1   | 3   | 2   | 2   |     |     |     |     |      |      |      | 3    | 1    |
| CO5                   | 1     | 3   | 3   | 1   | 3   | 2   | 3   | 1   | 2   | 2    | 3    | 2    | 1    | 3    |

**Course: Electronics Design Lab**  
**Course Code: PCC -EE-310G**

| S.NO. | Course Outcomes                                                                             | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the Noise in electronic systems; Sensors and signal conditioning circuits.        | L4<br>(Analyse)                |
| CO2   | To Understand the, CPLDs, and FPGAs, PCB design and layout; System assembly considerations. | L2<br>(Illustrate)             |
| CO3   | To Apply Embedded systems concept for group projects involving electronic hardware          | L3<br>(Apply)                  |
| CO4   | To Analyze Interfacing of analog and digital systems                                        | L4<br>(Analyse)                |
| CO5   | To Design Embedded systems, Electronic system design employing microcontrollers             | L6<br>(Design)                 |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 1     | 3   | 1   | 2   | 1   |     |     |     |     |      |      | 1    | 2    | 3    |
| CO2                   | 2     | 2   | 2   | 1   | 2   |     |     |     |     |      |      |      | 1    | 2    |
| CO3                   | 3     | 3   | 1   | 2   | 3   |     |     |     |     |      |      |      | 2    | 1    |
| CO4                   | 1     | 2   | 2   | 3   | 2   |     |     |     |     |      |      | 3    | 3    | 3    |
| CO5                   | 1     | 2   | 1   | 1   | 1   | 2   | 3   | 1   | 3   | 1    | 3    | 3    | 1    | 3    |

**Course: ORGANIZATIONAL BEHAVIOUR**  
**Course Code: HSMC-02G**

| S.N0. | Course Outcomes                                                               | RBT*- Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Identify how effectively and efficiently a manager manages their employees | L3<br>(Identify)               |
| CO2   | To Discuss own behaviour, attitudes and ethical views with students           | L4<br>(Discuss)                |
| CO3   | To Analyse the conflicts within an organization.                              | L4<br>(Analyse)                |
| CO4   | To Analyse how to improve the functional behaviour within an organization     | L4<br>(Analyse)                |
| CO5   | To Develop communication and administrative skills.                           | L6<br>(Developed)              |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 1     | 1   |     |     |     | 1   | 2   | 2   | 3   | 3    | 1    | 3    | 2    | 2    |
| CO2                   | 2     | 2   |     |     |     | 2   | 3   | 1   | 2   | 2    | 2    | 2    | 1    | 3    |
| CO3                   | 3     | 1   |     |     |     | 3   | 1   | 2   | 1   | 1    | 1    | 1    | 2    | 1    |
| CO4                   | 1     | 3   |     |     |     | 2   | 3   | 1   | 2   | 2    | 1    | 2    | 2    | 2    |
| CO5                   | 2     | 1   |     |     |     | 3   | 1   | 2   | 1   | 1    | 1    | 2    | 1    | 3    |

**Course: Power Electronics Lab**  
**Course Code: PCC-EE-308G**

| S.N0. | Course Outcomes                                                              | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------|--------------------------------|
| CO1   | Students will be able to Recall the various experiment instruments.          | L1<br>(Recall)                 |
| CO2   | Student will be able to Study different firing Circuits, Commutation Scheme. | L2<br>(Study)                  |
| CO3   | To Apply the Fully Control Converter Scheme for speed control of motor.      | L3<br>(Apply)                  |
| CO4   | To Analyze Static Characteristics of Power Electronics Device.               | L4<br>(Analyze)                |
| CO5   | To Design various protection Scheme of SCR and Inverter Circuit.             | L6<br>(Design)                 |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 2     | 1   | 1   | 2   | 1   |     |     |     |     |      |      |      | 1    | 3    |
| CO2                   | 2     | 1   | 3   | 3   | 2   |     |     |     |     |      |      |      | 3    | 1    |
| CO3                   | 1     | 2   | 1   | 2   | 2   |     |     |     |     |      |      |      | 1    | 2    |
| CO4                   | 1     | 2   | 1   | 1   | 3   |     |     |     |     |      |      |      | 3    | 1    |
| CO5                   | 3     | 1   | 3   | 1   | 1   | 2   | 3   | 1   | 3   | 1    | 3    | 2    | 2    | 3    |

**Course: Power Systems– II**  
**Course Code: PCC - EE-302G**

| S.N0. | Course Outcomes                                                       | RBT*- Revised Bloom's Taxonomy |
|-------|-----------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall basic of power system economics.                            | L1<br>(Recall)                 |
| CO2   | To Explain the methods to control the voltage, frequency, power flow. | L2<br>(Understand)             |
| CO3   | To Apply the stability constraints in synchronous grid.               | L3<br>(Apply)                  |
| CO4   | To Analyze a power system in steady state by using numerical methods. | L4<br>(Analyze)                |
| CO5   | To Design a stable power system network                               | L6<br>(Design)                 |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 2     | 1   | 1   | 1   | 1   |     |     |     |     |      |      |      | 1    | 1    |
| CO2                   | 3     | 2   | 3   | 1   | 1   |     |     |     |     |      | 1    |      | 2    | 1    |
| CO3                   | 1     | 3   | 2   | 3   | 2   |     |     |     |     |      |      | 2    | 3    | 3    |
| CO4                   | 2     | 1   | 2   | 2   | 2   |     |     |     |     |      |      |      | 1    | 1    |
| CO5                   | 3     | 1   | 3   | 1   | 1   | 2   | 3   | 1   | 3   | 3    | 2    | 3    | 2    | 1    |



Course: Power Systems–II Lab  
Course Code: LC -EE-304G

| S.N0. | Course Outcomes                                                                                                                                                                    | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the various measuring instrument and experimental equipment.                                                                                                             | L1<br>(Recall)                 |
| CO2   | To understand PV modules and their characteristics like open circuit voltage, short circuit current, Fill factor, Efficiency, wind energy, wind speed versus power generation.     | L2<br>(Understand)             |
| CO3   | To Analyze negative and zero sequence reactances of an alternator and fault current for L-G, L-L, L-L-G and L-L-L faults at the terminals of an alternator at very low excitation. | L4<br>(Analyze)                |
| CO4   | To evaluate using software steady state, transient and sub-transient short circuit currents in an alternator                                                                       | L5<br>(Evaluation)             |
| CO5   | To Simulate using software fault in Power System.                                                                                                                                  | L6<br>(Simulation)             |

#### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   | 1   | 1   | 1   |     |     |     |     |      |      |      | 1    | 1    |
| CO2                   | 3     | 2   | 2   | 2   | 2   |     |     |     |     |      | 1    |      | 2    | 3    |
| CO3                   | 2     | 1   | 2   | 3   | 1   |     |     |     |     |      |      | 2    | 1    | 2    |
| CO4                   | 1     | 2   | 3   | 2   | 2   |     |     |     |     |      |      |      | 2    | 1    |
| CO5                   | 1     | 1   | 1   | 3   | 1   | 2   | 3   | 1   | 3   | 1    | 3    | 2    | 3    | 2    |

**Course: VHDL and Digital Design**  
**Course Code: OEC-EE-03G**

| S.NO. | Course Outcomes                                                                                                     | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the construction, principle of combinational and sequential circuit & microcomputer & programmable device | L1<br>(Recall)                 |
| CO2   | To Understand the concept of modeling & simulation & its role in digital evaluation.                                | L2<br>(Understand)             |
| CO3   | To Analyze performance characteristics of microcomputers & combinational and sequential circuit.                    | L4<br>(Analyze)                |
| CO4   | To Evaluate the basic VHDL statements & logical operators.                                                          | L5<br>(Evaluation)             |
| CO5   | To Create Digital circuit such as comparators, multiplexers, demultiplexers, encoders & microcomputers.             | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

[illegible]

## B.Tech. EE 7th Semester

Course: Electronic Principles  
Course Code: OEC-EE-451G

| S.N0. | Course Outcomes                                                                                              | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge about electronic device, digital electronics and display system.               | L1<br>(Recall)                 |
| CO2   | To Understand the knowledge about the behavior of electronic device, digital electronics and display system. | L2<br>(Understand)             |
| CO3   | To Analyze theoretical and practical knowledge of electronic device, digital electronics and display system. | L4<br>(Analyze)                |
| CO4   | To Evaluate the output of digital circuit and electronic circuit.                                            | L5<br>(Evaluation)             |
| CO5   | To Design the display system, digital and electronics devices.                                               | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   | 1   | 2   | 1   |     |     |     |     |      |      |      | 3    | 3    |
| CO2                   | 3     | 2   | 2   | 2   | 2   |     |     |     |     |      |      |      | 3    | 3    |
| CO3                   | 3     | 3   | 2   | 2   | 2   |     |     |     |     |      |      |      | 2    | 2    |
| CO4                   | 3     | 1   | 2   | 2   | 2   |     |     |     |     |      |      |      | 3    | 1    |
| CO5                   | 3     | 1   | 3   | 1   | 1   | 2   | 2   | 1   | 2   | 1    | 1    | 2    | 3    | 2    |

**Course: Microcontroller Based System Design**  
**Course Code: PEC- EE-413G**

| S.NO. | Course Outcomes                                                          | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge of PIC MC                                  | L1<br>(Recall)                 |
| CO2   | To Understand use of interrupts and timers.                              | L2<br>(Understand)             |
| CO3   | To Analysis the functional block of ARM processor.                       | L4<br>(Analysis)               |
| CO4   | To Evaluate on the peripheral dives for data communication and transfer. | L5<br>(Evaluvation)            |
| CO5   | To Design computing plat fame and software engineering problem.          | L6<br>(Design)                 |

## CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     |     |     |     |     |     | 1   |     | 2   |      | 2    |      | 1    | 1    |
| CO2                   | 3     | 3   | 2   | 2   |     |     |     |     | 3   |      |      | 1    | 2    | 2    |
| CO3                   | 3     | 3   | 1   | 3   |     |     |     |     |     |      |      | 1    | 2    | 2    |
| CO4                   | 3     | 3   | 3   | 2   |     |     |     |     | 2   |      | 1    | 1    | 3    | 3    |
| CO5                   | 3     |     | 3   |     | 2   |     |     |     |     |      |      | 1    | 3    | 2    |

**Course: Renewable energy and Distributed Generation**  
**Course Code: OEC-EE-403G**

| S.NO. | Course Outcomes                                                                      | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic of various renewable energy sources.                             | L1<br>(Recall)                 |
| CO2   | To Understand the distributed generation system in autonomous /grid connected modes. | L2<br>(Understand)             |
| CO3   | To Analyze the integrated operation of renewable energy sources.                     | L4<br>(Analysis)               |
| CO4   | To Evaluate the impact of distributed generation on power system..                   | L5<br>(Evaluation)             |
| CO5   | To construct the power electronic interface with grid.                               | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     |     |     |     |     |     | 1   |     | 2   |      | 2    |      | 1    | 1    |
| CO2                   | 3     | 3   | 2   | 2   |     |     |     |     | 3   |      |      | 1    | 2    | 2    |
| CO3                   | 3     | 3   | 1   | 3   |     |     |     |     |     |      |      | 1    | 2    | 2    |
| CO4                   | 3     | 3   | 3   | 2   |     |     |     |     | 2   |      | 1    | 1    | 3    | 1    |
| CO5                   | 3     |     | 3   |     | 2   |     |     |     |     |      |      | 1    | 3    | 3    |

**Course: Project Stage-1**  
**Course Code: Proj-EE-423G**

| S.N0. | Course Outcomes                                                             | RBT*- Revised Bloom's Taxonomy |
|-------|-----------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall and finalized the topic.                                          | L1<br>(Recall)                 |
| CO2   | To Study of published literature work on the assigned topic                 | L2<br>(Study)                  |
| CO3   | To Preparing an Action Plan and mathology for conducting the investigation. | L3<br>(Preparation)            |
| CO4   | To Evaluate the project cost.                                               | L5<br>(Evaluate)               |
| CO5   | Student will present the PPT on the concerned Topic.                        | L6<br>(Presentation)           |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 1     | 1   | 1   | 2   | 1   |     |     |     | 2   | 2    |      | 2    | 1    | 3    |
| CO2                   | 2     | 1   | 2   | 1   | 3   |     |     |     | 2   | 1    |      | 3    | 3    | 1    |
| CO3                   | 2     | 3   | 1   | 3   | 2   | 2   |     |     | 2   | 3    | 2    | 2    | 2    | 2    |
| CO4                   | 3     | 2   | 2   | 2   | 3   | 1   |     | 1   | 2   | 1    | 1    | 2    | 3    | 3    |
| CO5                   | 1     | 1   | 3   | 1   | 2   | 2   | 3   | 2   | 2   | 1    | 2    | 1    | 3    | 2    |

Course: Summer internship  
Course Code: INT-EE-425G

| S.N0. | Course Outcomes                                                                                 | RBT*- Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall and enhance the topic assigned in the light of report prepared under project stage-1. | L1<br>(Recall)                 |
| CO2   | To Study of published literature on the assigned topic.                                         | L2<br>(Understand)             |
| CO3   | To Preparing an Action Plan for conducting the investigation.                                   | L3<br>(Apply)                  |
| CO4   | To Evaluate the project and prepare thesis work.                                                | L5<br>(Evaluate)               |
| CO5   | To Present Summer Internship Persentation.                                                      | L5<br>(Persentation)           |

#### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 1     | 1   | 1   | 2   | 1   |     |     |     | 2   | 2    |      | 2    | 1    | 3    |
| CO2                   | 2     | 1   | 2   | 1   | 3   |     |     |     | 2   | 1    |      | 3    | 3    | 1    |
| CO3                   | 2     | 3   | 1   | 3   | 2   | 2   |     |     | 2   | 3    | 2    | 2    | 2    | 2    |
| CO4                   | 3     | 2   | 2   | 2   | 3   | 1   |     | 1   | 2   | 1    | 1    | 2    | 3    | 3    |
| CO5                   | 1     | 1   | 3   | 1   | 2   | 2   | 3   | 2   | 2   | 1    | 2    | 1    | 3    | 2    |

**Course: Power management**  
**Course Code: PEC-EE-401G**

| S.NO. | Course Outcomes                                                                         | RBT*- Revised Bloom's Taxonomy |
|-------|-----------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge about the present power scenario                          | L4<br>(Analyse)                |
| CO2   | To Understand the knowledge about the general layout of various engineering equipments. | L2<br>(Understand)             |
| CO3   | To Analyze theoretical and practical knowledge power utility of Haryana.                | L4<br>(Analyse)                |
| CO4   | To Evaluate the various risk and hazards in the concern area.                           | L5<br>(Evaluate)               |
| CO5   | To Develop the state and central electrical power cooperation                           | L6<br>(Identify and choose)    |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     |     |     |     |     |     |     |     |     |      |      |      | 1    | 1    |
| CO2                   |       | 3   | 2   |     |     |     |     |     |     |      |      |      | 2    | 2    |
| CO3                   | 2     | 3   |     | 2   |     |     |     |     |     |      |      |      | 2    | 2    |
| CO4                   | 3     |     | 2   | 2   |     |     |     |     |     |      |      |      | 2    | 1    |
| CO5                   | 3     | 2   |     |     | 2   | 2   |     |     |     |      |      |      | 2    | 2    |



**Course: Fundamentals of Management**  
**Course Code: HSMC -08G**

| S.N0. | Course Outcomes                                                                     | RBT*- Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Describe the Basics of Management and the role of Management in an organization. | L2<br>(Understand)             |
| CO2   | To Explain the Importance of Staffing and Training                                  | L2<br>(Understand)             |
| CO3   | To Discuss the concept of Material management and Inventory Control.                | L2<br>(Understand)             |
| CO4   | To Analyze the components of Marketing and Advertising.                             | L4<br>(Analyze)                |
| CO5   | To Assess the Various sources of Finance and Capital Structure.                     | L5<br>(Evaluate)               |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   |       |     |     |     |     | 2   |     | 2   |     | 2    |      | 1    | 3    | 2    |
| CO2                   |       |     |     | 1   |     | 1   |     | 3   |     | 3    |      | 2    | 3    | 2    |
| CO3                   |       |     |     |     | 1   | 3   |     | 2   |     | 2    |      | 2    | 3    | 2    |
| CO4                   |       |     |     | 2   |     | 2   |     | 2   | 1   | 1    |      | 2    | 2    | 3    |
| CO5                   |       |     |     |     |     |     | 1   | 1   |     | 1    |      | 2    | 1    | 1    |

## EE 8th Semester

**Course: General proficiency**

**Course Code: GP-EE-426G**

| S.N0. | Course Outcomes                                                                                        | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Express a sense of professionalism                                                                  | L1<br>(Recall)                 |
| CO2   | Students will be able to Practice and improve their communications skill.                              | L2<br>(Illustrate)             |
| CO3   | To Analyze his/her overall personal developments.                                                      | L3<br>(Apply)                  |
| CO4   | To Develop his/her personality in terms of quality such as reciving, responding, attitude and outlook. | L4<br>(Analyse)                |
| CO5   | To Evaluate his /her efforts on the basic of performance/achievements in different walks of life.      | L5<br>(Evaluate)               |

### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   | 1   | 3   | 2   | 1   |     | 1   |     | 2    |      | 1    | 3    | 1    |
| CO2                   | 1     | 2   | 2   | 2   | 2   | 3   |     | 2   |     |      |      |      | 1    | 2    |
| CO3                   | 1     | 2   | 1   | 3   | 1   | 1   |     | 1   |     |      | 1    | 2    | 1    | 2    |
| CO4                   | 3     | 3   | 2   | 2   | 2   | 3   |     | 3   | 1   |      | 2    | 3    | 3    | 3    |
| CO5                   | 1     | 2   | 3   | 3   | 3   | 2   |     | 2   | 2   |      | 1    | 2    | 1    | 2    |

**Course: INTELLIGENT INSTRUMENTATION FOR ENGINEERS**  
**Course Code: OEC-ECE-452-G**

| S.NO. | Course Outcomes                                                                                                                                                         | RBT*- Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the concept of intelligent instrumentation & interfacing of instruments with computer.                                                                        | L4<br>(Analyse)                |
| CO2   | To Explain the construction, principle of operation and performance of serial & parallel communication line & star networks and low pass filters and high pass filters. | L2<br>(Illustrate)             |
| CO3   | To Analyze performance characteristics of intelligent instrumentation and spike filters and low and high pass filters.                                                  | L4<br>(Analyse)                |
| CO4   | To Evaluate the performance of low pass filter and high pass filter & star networks and bus networks.                                                                   | L5<br>(Evaluate)               |
| CO5   | To Design the intelligent instrumentation and low pass filter and high pass filter.                                                                                     | L6<br>(Design)                 |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 2     | 1   | 1   | 1   | 1   |     |     |     |     |      |      | 1    | 3    | 3    |
| CO2                   | 1     | 2   | 1   | 2   | 2   |     |     |     |     |      |      |      | 3    | 2    |
| CO3                   | 3     | 3   | 2   | 1   | 2   |     |     |     | 1   |      | 2    |      | 2    | 2    |
| CO4                   | 1     | 1   | 2   | 2   | 2   |     |     |     | 3   |      |      | 2    | 3    | 3    |
| CO5                   | 1     | 2   | 3   | 1   | 1   | 3   | 1   |     | 1   |      |      | 2    | 3    | 1    |

Course: Project stage-2  
Course Code: PROJ-EE-422G

| S.NO. | Course Outcomes                                                                                 | RBT*- Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall and enhance the topic assigned in the light of report prepared under project stage-1. | L1<br>(Recall)                 |
| CO2   | To review and Explain of the approach to the problem relating to assigned topic.                | L2<br>(Illustrate)             |
| CO3   | To review and Explain of the approach to the problem relating to assigned topic.                | L3<br>(Apply)                  |
| CO4   | To Evaluate the project and prepare thesis work                                                 | L4<br>(Analyse)                |
| CO5   | To Modeling /Simulation/Design/Problem Solving Experiment as needed                             | L5<br>(Evaluate)               |

#### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 1     | 1   | 1   | 2   | 1   |     |     |     | 2   | 2    |      | 2    | 1    | 3    |
| CO2                   | 2     | 1   | 2   | 1   | 3   |     |     |     | 2   | 1    |      | 3    | 3    | 1    |
| CO3                   | 1     | 3   | 1   | 3   | 2   | 2   |     |     | 2   | 3    | 2    | 2    | 2    | 2    |
| CO4                   | 3     | 2   | 2   | 2   | 3   | 1   |     | 1   | 2   | 1    | 1    | 2    | 3    | 3    |
| CO5                   | 1     | 1   | 1   | 1   | 2   | 2   | 3   | 2   | 2   | 1    | 2    | 1    | 3    | 2    |

**Course Code: PEC-EE-402G**

### CO PO-PSO Articulation Matrices

[illegible]

Course: Seminar  
Course Code: SEM-EE-424G

| S.N0. | Course Outcomes                                                                                        | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Express a sense of professionalism                                                                  | L1<br>(Recall)                 |
| CO2   | To Practice and improve their communications skill.                                                    | L2<br>(Illustrate)             |
| CO3   | To Analyze his/her overall personal developments.                                                      | L3<br>(Apply)                  |
| CO4   | To Develop his/her personality in terms of quality such as reciving, responding, attitude and outlook. | L4<br>(Analyse)                |
| CO5   | To Evaluate his /her efforts on the basic of performance/achievements in different walks of life.      | L5<br>(Evaluate)               |

#### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   | 3   | 3   | 3   | 2   | 2   | 1   | 2   | 2    | 1    |      | 2    | 2    |
| CO2                   | 2     | 1   | 3   | 2   | 2   | 2   | 2   | 3   | 2   | 1    | 2    | 2    | 3    | 3    |
| CO3                   | 1     | 3   | 2   | 2   | 3   | 2   | 2   | 1   | 1   | 3    | 1    | 2    | 1    | 2    |
| CO4                   | 3     | 2   | 1   | 1   | 2   | 1   | 2   | 1   | 2   | 1    | 2    | 1    | 3    | 3    |
| CO5                   | 3     | 3   | 3   | 3   | 3   | 2   | 2   | 1   | 2   | 1    | 1    | 2    | 3    | 1    |

**Course: Solar Thermal Applications**

**Course Code: OEC- EE-402G**

| S.N0. | Course Outcomes                                                        | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge of solar thermal energy                  | L4<br>(Analyse)                |
| CO2   | To Understand concept about solar energy systems and devices.          | L2<br>(Understand)             |
| CO3   | To Apply the concept about storage of solar energy system and devices. | L3<br>(Apply)                  |
| CO4   | To Analysis solar system in detail along with practical case studies.  | L4<br>(Analyse)                |
| CO5   | To installation and Design the solar grid thermal application.         | L6<br>(Design)                 |

#### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   | 1   | 1   | 1   |     |     |     |     |      |      |      | 3    | 3    |
| CO2                   | 2     | 2   | 3   | 2   | 2   |     |     |     |     |      |      | 1    | 2    | 1    |
| CO3                   | 3     | 1   | 1   | 3   | 3   |     |     |     |     |      |      |      | 1    | 2    |
| CO4                   | 2     | 2   | 1   | 2   | 2   |     |     |     |     |      |      | 3    | 2    | 3    |
| CO5                   | 1     | 1   | 2   | 1   | 1   | 2   | 3   | 1   | 3   | 1    | 2    | 2    | 3    | 1    |

**Program Outcomes (POs)**  
**Program Specific Outcomes (PSO)**  
**Course Outcomes (COs)**  
**&**  
**CO PO-PSO Articulation Matrices**



**Department of Electrical Engineering**  
**BRCM**  
**College of Engineering & Technology**



## **Program Outcomes (PO) as defined by NBA**

**Engineering Graduates will be able to:**

- 1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.**
- 2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.**
- 3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.**
- 4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.**
- 5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.**
- 6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.**
- 7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.**
- 8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.**

**9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.**

**10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.**

**11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.**

**12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.**

### **Program Specific Outcomes (PSO)**

**At the end of the program, the student**

**PSO1: Ability to utilize logical and technical skills to model, simulate and analyze electrical components and systems and Empowering to provide socially acceptable technical solutions to real time electrical engineering problems with the application of modern and appropriate techniques for sustainable development. n to complex Electrical engineering problems in generation, transmission and distribution of electrical power and its control. Also contribute for the development of smart power grid and integrating green energy on it to meet the increasing demand of the society.**

**PSO2: Able to provide socially acceptable technical solution to complex Electrical engineering problems in generation, transmission and distribution of electrical power and its control. Also contribute for the development of smart power grid and integrating green energy on it to meet the increasing demand of the society.**

## B.Tech. EE 3rd Semester

Course: Analog Electronics  
Course Code: PCC- EE-205G

| S.NO. | Course Outcomes                                                                                                                            | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | Students will be able to recall the basic knowledge of electronics devices.                                                                | L1<br>(Recall)                 |
| CO2   | Students will be able to understand and functioning and characteristics of transistor BJT,MOSFET OP-AMP                                    | L2<br>(Understand)             |
| CO3   | Student will be able to Apply the concept of operating mode of analog circuits.                                                            | L3<br>(Apply)                  |
| CO4   | Student will be able to analyze the OP-AMP based circuit and linear and non linear application of OP-AMP ,and MOSFET and BJT based circuit | L4<br>(Analyse)                |
| CO5   | Student will be able to design the Analog circuits using analog components.                                                                | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 2     | 1   | 0   |     |     |     |     |     |     |      |      | 1    | 3    | 2    |
| CO2                   | 3     | 1   |     |     |     |     |     |     | 2   |      |      |      | 3    | 3    |
| CO3                   | 2     | 3   |     |     |     | 2   |     |     |     |      |      |      | 3    | 3    |
| CO4                   | 2     |     |     |     |     |     |     |     |     | 3    |      | 3    | 2    | 2    |
| CO5                   | 2     | 1   |     |     | 3   |     | 1   |     |     |      |      | 2    | 2    | 3    |

Course-Electric Circuit Analysis  
Course Code: PCC- EE- 201G

| S.NO. | Course Outcomes                                                                                                                                                                                    | RBT*- Revised Bloom's Taxonomy |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall about DC Network AC Network and Network Theorems.                                                                                                                                        | L1<br>(Recall)                 |
| CO2   | To Understand Solution of First and Second order networks, Relationship between two port networks.                                                                                                 | L2<br>(Understand)             |
| CO3   | To Apply the Concept of Hurwitz polynomials, positive real functions. Properties of real immittance functions, Synthesis of LC driving point immittances, Synthesis of RC driving point impedances | L3<br>(Apply)                  |
| CO4   | To Analyze Electrical Circuit Using Laplace Transforms and Two Port Network and Network Functions and DC Network theorem                                                                           | L4<br>(Analyse)                |
| CO5   | To Evaluate different Electrical parameter of Network                                                                                                                                              | L5<br>(Evaluate)               |

CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   | 1   |     |     | 1   |     |     |     |      |      | 2    | 2    | 2    |
| CO2                   | 3     | 2   | 1   |     | 2   | 1   |     |     |     |      |      | 2    | 3    | 1    |
| CO3                   | 3     | 2   | 2   | 2   | 2   | 1   |     |     |     |      |      | 2    | 2    | 2    |
| CO4                   | 3     | 2   | 3   | 2   | 2   | 1   |     |     |     |      |      | 2    | 2    | 2    |
| CO5                   | 3     | 2   | 2   |     | 2   | 1   |     |     |     |      |      | 2    | 1    | 1    |

**Course-Electrical Machines-I**  
**Course Code: PCC-EE- 209G**

| S.NO. | Course Outcomes                                                                                                  | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the concept of magnetic circuit.                                                                       | L1<br>(Recall)                 |
| CO2   | To Understand the construction, principle of operation and performance of DC machine.                            | L2<br>(Understand)             |
| CO3   | To Analyze the difference in operation of different DC machine configurations and characteristics of DC machine. | L4<br>(Analyse)                |
| CO4   | To Evaluate the basic knowledge about motoring , generating and breaking mode of DC machine.                     | L5<br>(Evaluate)               |
| CO5   | To Design the single phase and three phase transformer circuit patameters                                        | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 2   |     |     |     |     |     |     |     |      |      |      | 3    | 1    |
| CO2                   | 3     | 3   | 1   | 2   |     |     |     |     |     |      |      |      | 2    | 3    |
| CO3                   | 3     | 2   | 2   | 3   |     |     |     |     |     |      |      |      | 3    | 2    |
| CO4                   | 3     | 3   | 2   | 3   | 1   |     |     |     |     |      |      | 2    | 2    | 1    |
| CO5                   | 3     | 2   | 2   | 2   | 1   |     |     |     |     |      |      | 2    | 2    | 2    |

**Course Code: PCC- EE- 210G**

| S.NO. | Course Outcomes                                                                                 | RBT*- Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge about the various measuring instruments.                          | L1<br>(Recall)                 |
| CO2   | To Explain the construction operating principal of different electronic devices.                | L2<br>(Understand)             |
| CO3   | To Analyses the performance of energy meter, wattmeter, power factor meter and frequency meter. | L3<br>(Apply)                  |
| CO4   | To Evaluate the static character of instruments.                                                | L4<br>(Analyse)                |
| CO5   | To Compare the measurement of parameter and variable with the help of AC and Dc bridges.        | L5<br>(Evaluate)               |

### CO PO-PSO Articulation Matrices

[illegible]

**Course-Engineering Mechanics**  
**Course Code: ESC-202-G**

| S.N0. | Course Outcomes                                                                             | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the concepts of Engineering Mechanics.                                            | L1<br>(Recall)                 |
| CO2   | To Understand the concepts of rigid bodies, vectors, tensors and co-ordinate systems.       | L2<br>(Understand)             |
| CO3   | To Apply knowledge to solve in to derive the various important terms related to rigid body. | L3<br>(Apply)                  |
| CO4   | To Analyze the various beams using different loading conditions and different support.      | L4<br>(Analyse)                |
| CO5   | To Evaluate problems related to the bending Moment, gyroscopes, rigid body and torsion.     | L5<br>(Evaluate)               |

### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 2   | 2   | 1   | 1   | 1   |     |     |     |      |      | 3    | 2    | 2    |
| CO2                   | 3     | 3   | 2   | 1   | 1   | 1   |     |     |     |      |      | 3    | 3    | 1    |
| CO3                   | 3     | 3   | 2   | 2   | 1   | 1   |     |     |     |      |      | 3    | 2    | 2    |
| CO4                   | 3     | 3   | 2   | 2   | 1   |     |     |     |     |      |      | 3    | 2    | 2    |
| CO5                   | 3     | 2   | 2   | 1   | 1   |     |     |     |     |      |      | 3    | 1    | 1    |

**Course-Environmental Studies**  
**Course Code: MC-GES-106-G**

| S.N0. | Course Outcomes                                               | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------|--------------------------------|
| CO1   | To Recall basic knowledge about environment.                  | L1<br>(Recall)                 |
| CO2   | To Illustrate environmental pollutants.                       | L2<br>(Understand)             |
| CO3   | To Discuss individual efforts toward healthy environment.     | L4<br>(Discuss)                |
| CO4   | To Analyse various activities contributing towards pollution. | L4<br>(Analyse)                |
| CO5   | To Evaluate various pollution control Methods.                | L5<br>(Evaluate)               |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     |     |     |     |     | 1   | 1   |     |     |      |      | 2    | 3    | 3    |
| CO2                   | 3     |     |     |     |     | 2   | 2   | 1   |     |      |      | 1    | 3    | 2    |
| CO3                   | 1     |     |     |     |     | 3   | 3   | 1   | 2   | 1    |      | 2    | 3    | 1    |
| CO4                   | 1     |     |     |     |     | 3   | 3   | 1   | 2   | 1    |      | 2    | 3    | 1    |
| CO5                   | 1     |     |     |     |     | 2   | 2   | 1   | 1   | 1    |      | 3    | 3    | 2    |



**Course-Electric Circuit Analysis Lab**  
**Course Code: PCC- EE-203G**

| S.N0. | Course Outcomes                                                                                               | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge about measuring instrument and kit.                                             | L1<br>(Recall)                 |
| CO2   | To Study circuit creation & simulation software like MATLAB and Transient response of RC, RL circuit.         | L2<br>(Study)                  |
| CO3   | To Analyze a network of a given network function and verify its response.                                     | L4<br>(Analyse)                |
| CO4   | To Verify Z" & "Y" ,"ABCD" parameters of a two port network, and Compensation theorem and Tellegen's theorem. | L5<br>(Verify)                 |
| CO5   | To Design a DC or AC Network Using Software or simulation tool (P-Spice or Matlab)                            | L6<br>(Simulation)             |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   | 1   |     |     | 1   |     |     |     |      |      | 2    | 2    | 2    |
| CO2                   | 3     | 2   | 1   |     | 2   | 1   |     |     |     |      |      | 2    | 3    | 1    |
| CO3                   | 3     | 2   | 2   | 2   | 2   | 1   |     |     |     |      |      | 2    | 2    | 2    |
| CO4                   | 3     | 2   | 3   | 2   | 2   | 1   |     |     |     |      |      | 2    | 2    | 2    |
| CO5                   | 3     | 2   | 2   |     | 2   | 1   |     |     |     |      |      | 2    | 1    | 1    |

**Course-Electrical Machines-I Lab**  
**Course Code: PCC-EE-211G**

| S.N0. | Course Outcomes                                                        | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the various measuring instrument.                            | L1<br>(Recall)                 |
| CO2   | To Study and Measure the speed control of DC motor by methods.         | L2<br>(Study)                  |
| CO3   | To Apply the different methods for parallel operation of transformers. | L3<br>(Apply)                  |
| CO4   | To Evaluate different Performance test on transformer and DC machine.  | L5<br>(Evaluation)             |
| CO5   | To Compute and Plot various characteristics of DC Machine.             | L6<br>(Computing)              |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   |     |     |     |     |     |     |     |      |      |      | 2    | 2    |
| CO2                   | 3     | 3   | 2   | 2   |     |     |     |     |     |      |      |      | 3    | 1    |
| CO3                   | 3     | 2   | 2   | 2   |     |     |     |     |     |      |      | 2    | 2    | 2    |
| CO4                   | 3     | 3   | 2   | 2   |     | 2   |     |     |     |      |      |      | 2    | 2    |
| CO5                   | 3     | 2   | 2   | 2   |     |     |     | 2   |     |      |      |      | 1    | 1    |

**Course-Analog Electronics Lab**  
**Course Code: PCC-EE-207G**

| S.NO. | Course Outcomes                                                                                                                            | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | Students will be able to recall the basic knowledge of electronics devices.                                                                | L1<br>(Recall)                 |
| CO2   | Students will be able to understand and functioning and characteristics of transistor BJT,MOSFET OP-AMP                                    | L2<br>(Illustrate)             |
| CO3   | Student will be able to Apply the concept of operating mode of analog circuits.                                                            | L3<br>(Apply)                  |
| CO4   | Student will be able to analyze the OP-AMP based circuit and linear and non linear application of OP-AMP ,and MOSFET and BJT based circuit | L4<br>(Analyse)                |
| CO5   | Student will be able to design the Analog circuits using analog components.                                                                | L6<br>(Design)                 |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     |     |     |     |     |     |     |     | 2   |      |      |      | 3    | 2    |
| CO2                   |       | 3   |     |     |     | 2   |     |     |     |      |      |      | 3    | 1    |
| CO3                   | 2     |     |     |     |     |     |     |     |     | 3    |      |      | 3    | 2    |
| CO4                   | 2     |     |     |     | 3   |     | 1   |     |     |      |      |      | 2    | 2    |
| CO5                   |       |     | 3   | 2   |     |     |     | 3   |     |      |      |      | 2    | 1    |

**Course - Measurement & Instrumentation Lab**  
**Course Code: PCC- EE- 212G**

| S.NO. | Course Outcomes                                                                   | RBT*- Revised Bloom's Taxonomy    |
|-------|-----------------------------------------------------------------------------------|-----------------------------------|
| CO1   | To Recall the basic knowledge about measuring instrument and laboratory equipment | L1<br>(Recall)                    |
| CO2   | To Understand the calibration of electronic devices.                              | L2<br>(Illustrate)                |
| CO3   | To Analyze the measurement of resistance by different methods                     | L4<br>(Analyse)                   |
| CO4   | To Evaluate the knowledge of different bridge.                                    | L5<br>(Evaluate)                  |
| CO5   | To Draw performance characteristics different transducer                          | L6<br>(Performance justification) |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 2     | 2   | 1   | 2   |     |     |     |     | 2   | 3    |      |      | 3    | 2    |
| CO2                   |       | 2   | 2   |     |     |     |     |     | 2   |      |      |      | 2    | 2    |
| CO3                   | 3     | 1   | 2   | 1   |     |     |     |     | 2   |      |      |      | 3    | 1    |
| CO4                   | 2     | 3   | 3   | 3   |     |     |     |     | 2   |      |      |      | 1    | 1    |
| CO5                   | 3     | 2   | 3   | 2   |     |     |     |     | 2   |      |      |      | 1    | 1    |

## B.Tech. EE 4th Semester

**Course: Biology for Engineers**  
**Course Code: BSC-BIO-201G**

| S.NO. | Course Outcomes                                                                          | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the concepts of Biology.                                                       | L1<br>(Recall)                 |
| CO2   | To Understand about living organisms, type of cells and microbes. .                      | L2<br>(Understand)             |
| CO3   | To Apply Bimolecular Applications of biotechnology in Agriculture, Medicine, Environment | L3<br>(Apply)                  |
| CO4   | To Analyse of Concept of genetic engineering                                             | L4<br>(Analyse)                |
| CO5   | To Interpret Economic importance of microbes and Concept of genetic code, Central Dogma  | L6<br>(Interpret)              |

### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 2     | 2   | 2   | 2   |     |     | 3   |     |     | 2    |      | 1    | 1    | 2    |
| CO2                   | 1     | 3   | 1   | 1   |     |     | 2   |     |     | 3    |      | 3    | 2    | 1    |
| CO3                   | 2     | 2   | 2   | 2   |     |     | 1   |     |     | 2    |      | 2    | 3    | 2    |
| CO4                   | 3     | 3   | 3   | 1   |     |     | 2   |     |     | 3    |      | 3    | 2    | 0    |
| CO5                   | 2     | 1   | 2   | 3   |     |     | 2   |     |     | 2    |      | 2    | 3    | 0    |

**Course: Constitution of India**  
**Course Code: MC-105G**

| S.NO. | Course Outcomes                                                                                                                                   | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the Meaning of the constitution law and constitutionalism.                                                                              | L1<br>(Recall)                 |
| CO2   | To Understand Historical perspective of the Constitution of India and Salient features and characteristics of the Constitution of India.          | L2<br>(Understand)             |
| CO3   | To Apply the scheme of the Fundamental Duties and its legal status, the Directive Principles of State Policy.                                     | L3<br>(Apply)                  |
| CO4   | To Analyse Federal structure and distribution of legislative and financial powers between the Union and the States.                               | L4<br>(Analyse)                |
| CO5   | To Descibe Emergency Provisions : National Emergency, President Rule, Financial Emergency, Local Self Government – Constitutional Scheme in India | L5<br>(Desccribe)              |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 2     | 2   | 1   | 1   |     |     |     | 1   | 2   | 1    |      |      | 3    | 2    |
| CO2                   | 1     | 2   | 2   | 3   |     |     |     | 2   | 1   | 2    |      |      | 1    | 1    |
| CO3                   | 3     | 1   | 1   | 2   |     |     |     | 2   | 3   | 2    |      |      | 2    | 3    |
| CO4                   | 1     | 3   | 2   | 1   |     |     |     | 1   | 2   | 3    |      |      | 2    | 2    |
| CO5                   | 3     | 1   | 1   | 2   |     |     |     | 2   | 1   | 2    |      |      | 3    | 1    |

**Course: Digital Electronic**  
**Course Code: PCC-EE-202G**

| S.NO. | Course Outcomes                                                                                                                                                                      | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the digital signal, positive and negative logic, Boolean algebra, logic gates, logical variables, truth table, number systems, codes, and their conversion from to others. | L1<br>(Recall)                 |
| CO2   | To Understand the minimization techniques to simply the hardware requirements for digital circuits                                                                                   | L2<br>(Understand)             |
| CO3   | To Apply the working mechanism and design guidelines of different combinational, sequential circuits and their role in the digital system design.                                    | L3<br>(Apply)                  |
| CO4   | To Analyze different types of digital electronic circuits using various mapping and mathematical methods.                                                                            | L4<br>(Analyse)                |
| CO5   | To Design the different type of components - ADC and DAC, Semiconductor Memories and Programmable Logic Devices.                                                                     | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

[illegible]





**Course: Electromagnetic Fields**  
**Course Code: PCC-EE-216G**

| S.NO. | Course Outcomes                                                                                                                | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the knowledge of vector calculus.                                                                                    | L1<br>(Recall)                 |
| CO2   | To Understand the basic laws of Electromagnetism.                                                                              | L2<br>(Understand)             |
| CO3   | To Applying the electromagnetism laws for obtain the electric magnetic fields for simple configuration under static condition. | L3<br>(Apply)                  |
| CO4   | To Analyze time varying electric and magnetic fields.                                                                          | L4<br>(Analyse)                |
| CO5   | To Evaluate the Maxwell equation in different form and different media to understand the propagation of EM waves.              | L5<br>(Evaluate)               |

## CO PO-PSO Articulation Matrices

| <b>Course Outcomes<br/>(Cos)</b> | <b>(POs)</b> |            |            |            |            |            |            |            |            |             |             |             | <b>PSOs</b> |             |
|----------------------------------|--------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|
|                                  | <b>PO1</b>   | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> | <b>PO7</b> | <b>PO8</b> | <b>PO9</b> | <b>PO10</b> | <b>PO11</b> | <b>PO12</b> | <b>PSO1</b> | <b>PSO2</b> |
| <b>CO1</b>                       | <b>3</b>     | <b>1</b>   | <b>1</b>   | <b>1</b>   | <b>1</b>   |            |            |            |            |             |             |             | <b>3</b>    | <b>2</b>    |
| <b>CO2</b>                       | <b>2</b>     | <b>1</b>   | <b>3</b>   | <b>1</b>   | <b>3</b>   |            |            |            |            |             | <b>3</b>    |             | <b>2</b>    | <b>2</b>    |
| <b>CO3</b>                       | <b>3</b>     | <b>3</b>   | <b>1</b>   | <b>1</b>   | <b>1</b>   |            |            |            |            |             |             |             | <b>2</b>    | <b>3</b>    |
| <b>CO4</b>                       | <b>2</b>     | <b>3</b>   | <b>2</b>   | <b>2</b>   | <b>2</b>   |            |            |            |            |             |             | <b>2</b>    | <b>1</b>    | <b>1</b>    |
| <b>CO5</b>                       | <b>3</b>     | <b>1</b>   | <b>3</b>   | <b>1</b>   | <b>2</b>   |            |            |            |            |             |             |             | <b>2</b>    | <b>3</b>    |

**Course: Mathematics-III**  
**Course Code: BSC-MATH-204G**

| S.NO. | Course Outcomes                                                                                                                                                                                                            | RBT*- Revised Bloom's Taxonomy |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the mathematical tools needed in evaluating statistical data and find roots of polynomial.                                                                                                                       | L1<br>(Recall)                 |
| CO2   | To Understand how to find roots of polynomial and transcendental equations using numerical methods and solution the different type of numerical and statistical problem with the help of numerical methods and statistics. | L2<br>(Understand)             |
| CO3   | To Apply the statistical tools including measures of central tendency, correlation and solve problems involving random variables and numerical analysis.                                                                   | L3<br>(Apply)                  |
| CO4   | To Analyse the statistical methods of studying data samples and solution of numerical problems.                                                                                                                            | L4<br>(Analyse)                |
| CO5   | To Evaluate/Solve different type of differentiation and integration in numerical method and problems related to statistics (Hypothesis testing).                                                                           | L5<br>(Evaluate)               |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 2   | 1   | 3   |     |     |     | 3   | 3   | 1    |      |      | 2    | 1    |
| CO2                   | 2     | 1   | 2   | 1   |     |     |     | 1   | 2   | 3    |      |      | 3    | 2    |
| CO3                   | 3     | 3   | 1   | 2   |     |     |     | 2   | 3   | 2    |      |      | 2    | 3    |
| CO4                   | 3     | 2   | 3   | 1   |     |     |     | 2   | 3   | 3    |      |      | 3    | 2    |
| CO5                   | 3     | 2   | 2   | 2   |     |     |     | 2   | 2   | 2    |      |      | 3    | 3    |

**Course: Signals and System**  
**Course Code: PCC-EE-214G**

| S.NO. | Course Outcomes                                                                                                                                | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic concept of various signals with their mathematical description and representation of continuous and discrete time signals. | L1<br>(Recall)                 |
| CO2   | To Understand the knowledge about the input output relationship for different systems.                                                         | L2<br>(Understand)             |
| CO3   | To Apply the knowledge of different mathematical tools ( F.T,DTFT,LT and ZT) to resolve the signal in frequency domain .                       | L3<br>(Apply)                  |
| CO4   | To Analyze the limitations and application of different tools in C.T. & D.T. signals and system.                                               | L4<br>(Analyse)                |
| CO5   | To Design the first and second order system filters.                                                                                           | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

[illegible]

**Course: Transmission and Distribution**  
**Course Code: PCC- EE-210G**

| S.NO. | Course Outcomes                                                                                            | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge about the structure and present day scenario of a power system.              | L1<br>(Recall)                 |
| CO2   | To Explain the mechanical design of transmission line with skin effect and proximity effect.               | L2<br>(Explain)                |
| CO3   | To Analyses the performance of transmission line as well as transmission and distribution lines parameter. | L4<br>(Analyse)                |
| CO4   | To Evaluate and compare various cables and insulator grading as well as rating.                            | L5<br>(Evaluate)               |
| CO5   | To Design a proper transmission and distribution structure of a power system.                              | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

[illegible]



**Course: Electrical machine-2 Lab**  
**Course Code: PCC-EE-208G**

| S.NO. | Course Outcomes                                                                                                                                                                             | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the various measuring instrument                                                                                                                                                  | L1<br>(Recall)                 |
| CO2   | To Study and Measure the speed control of induction motor by rotor resistance control.8. Study of Power (Load) sharing between two Three Phase alternators in parallel operation Condition. | L2<br>(Understand)             |
| CO3   | To Apply the different methods for Synchronization of two Three Phase Alternators                                                                                                           | L3<br>(Apply)                  |
| CO4   | To Evaluate different Performance test on synchronous generator and Induction motor                                                                                                         | L4<br>(Analyse)                |
| CO5   | To Compute and Plot varioue characteristics of Machine                                                                                                                                      | L5<br>(Evaluate)               |

### CO PO-PSO Articulation Matrices

[illegible]

**Course: Transmission and Distribution LAB**  
**Course Code: PCC-EE-212G**

| S.NO. | Course Outcomes                                                                                             | RBT*- Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge about measuring instrument and laboratory equipment.                          | L1<br>(Recall)                 |
| CO2   | To Understand the Power System blocks in MATLAB, transmission line parameters and proximity and skin effect | L2<br>(Understand)             |
| CO3   | To Analyze the Ferranti effect in a model of transmission line.                                             | L3<br>(Apply)                  |
| CO4   | To Evaluate the transmission line parameters                                                                | L4<br>(Analyse)                |
| CO5   | To Design short and long transmission line using MATLAB.                                                    | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

[illegible]

## B.Tech. EE 5th Semester

**Course: Electrical Drives**

**Course Code: PEC-EE-03G**

| S.N0. | Course Outcomes                                                                   | RBT*- Revised Bloom's Taxonomy |
|-------|-----------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge of electric drives                                  | L1<br>(Recall)                 |
| CO2   | To Understand the basic of multi-quadrant operation of DC drives                  | L2<br>(Understand)             |
| CO3   | To Analysis the characteristic of Dc motor induction motor.                       | L4<br>(Analyse)                |
| CO4   | To Evaluate the principles of speed control of Dc motor and induction motor.      | L5<br>(Evaluate)               |
| CO5   | To Devolve the power electronic converter used for induction motor speed control. | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     |     |     |     |     |     | 1   |     | 2   |      | 2    |      | 1    | 1    |
| CO2                   | 3     | 3   | 2   | 2   |     |     |     |     | 3   |      |      | 1    | 2    | 2    |
| CO3                   | 3     | 3   | 1   | 3   |     |     |     |     |     |      |      | 1    | 2    | 2    |
| CO4                   | 3     | 3   | 3   | 2   |     |     |     |     | 2   |      | 1    | 1    | 3    | 1    |
| CO5                   | 3     |     | 3   |     | 2   |     |     |     |     |      |      | 1    | 3    | 3    |



**Course: Economics for Engineers**  
**Course Code: HSMC-01G**

| S.N0. | Course Outcomes                                                                                                            | RBT*- Revised Bloom's Taxonomy |
|-------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Describe the Basics of Economic Theories terminology, Cost concepts and Pricing Policies Used in Engineering Economics. | L1<br>(Recall)                 |
| CO2   | To Summarize the measures of national income, the functions of banks and concepts of globalization                         | L2<br>(Understand)             |
| CO3   | To Discuss how supply and demand change when a product's price changes                                                     | L4<br>(Analyse)                |
| CO4   | To Use the Concept of Demand to explain the Outcomes of markets for individuals firms and society                          | L5<br>(Evaluate)               |
| CO5   | To Analyze how a change in price and income affects the behaviour of buyers and sellers.                                   | L4<br>(Analyse)                |

### CO PO-PSO Articulation Matrices

| <b>Course Outcomes (Cos)</b> | <b>(POs)</b> |            |            |            |            |            |            |            |            |             |             |             | <b>PSOs</b> |             |
|------------------------------|--------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|
|                              | <b>PO1</b>   | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> | <b>PO7</b> | <b>PO8</b> | <b>PO9</b> | <b>PO10</b> | <b>PO11</b> | <b>PO12</b> | <b>PSO1</b> | <b>PSO2</b> |
| <b>CO1</b>                   |              |            |            |            |            |            |            |            |            |             |             |             | <b>1</b>    | <b>1</b>    |
| <b>CO2</b>                   | <b>3</b>     |            |            |            |            |            |            |            |            |             |             |             | <b>2</b>    | <b>1</b>    |
| <b>CO3</b>                   |              | <b>3</b>   | <b>2</b>   |            |            |            |            |            |            |             |             |             | <b>3</b>    | <b>3</b>    |
| <b>CO4</b>                   | <b>2</b>     | <b>3</b>   |            | <b>2</b>   |            |            |            |            |            |             |             |             | <b>2</b>    | <b>2</b>    |
| <b>CO5</b>                   | <b>3</b>     |            | <b>2</b>   | <b>2</b>   |            |            |            |            |            |             |             |             | <b>2</b>    | <b>1</b>    |

**Course: Microprocessor& Microcontroller**  
**Course Code: PCC-EE-309G**

| S.NO. | Course outcomes                                                                                                                                         | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge of microprocessor and microcontroller.                                                                                    | L1<br>(Recall)                 |
| CO2   | To Understand the construction, principle of operation and pin configuration and architecture of microprocessor ,microcontroller and peripheral devices | L2<br>Understand               |
| CO3   | To Write the programming by the understanding of instruction sets of microprocessor and microcontroller.                                                | L2<br>(Define and understand)  |
| CO4   | To Analyze the interfacing of microcontroller and peripheral devices                                                                                    | L4<br>(Analyse)                |
| CO5   | To Design the programming machines using microprocessor and microcontroller                                                                             | L6<br>(Design)                 |

#### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   |       |     |     |     |     |     |     |     | 3   |      |      |      | 3    | 2    |
| CO2                   | 2     | 2   | 3   | 3   | 3   |     |     |     |     |      |      |      | 3    | 3    |
| CO3                   | 2     |     | 3   | 3   | 3   |     |     |     |     |      |      |      | 2    | 2    |
| CO4                   |       |     | 3   | 3   |     |     |     |     |     | 2    |      |      | 3    | 3    |
| CO5                   | 3     | 3   | 2   |     | 2   | 2   |     |     |     | 2    |      | 3    | 3    | 3    |

**Course: Power system-1**  
**Course Code: PCC-EE-301G**

| S.NO. | Course Outcomes                                                                 | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall basic concept of power system structure.                              | L1<br>(Recall)                 |
| CO2   | To Explain the various power system components.                                 | L2<br>(Illustrate)             |
| CO3   | To Use the basic knowledge of protection schemes and circuit breaker.           | L2<br>(Define and understand)  |
| CO4   | To Analyze fault current for different current fault.                           | L4<br>(Analyse)                |
| CO5   | To Evaluate concept of HVDC power transmission and renewable energy generation. | L5<br>(Evaluate)               |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 3   |     | 2   | 2   |     |     |     | 2   | 2    |      | 2    | 3    | 2    |
| CO2                   | 3     | 3   | 3   | 2   | 3   |     |     |     | 2   | 2    |      | 2    | 3    | 1    |
| CO3                   | 3     | 3   | 3   | 2   | 3   |     |     |     | 2   | 2    |      | 2    | 2    | 2    |
| CO4                   | 3     | 3   | 3   | 2   | 3   |     |     |     | 2   | 2    |      | 2    | 3    | 1    |
| CO5                   | 3     | 3   | 3   | 2   | 3   |     |     |     |     | 2    |      | 2    | 3    | 3    |

**Course: Computer Aided Electrical Machine Design**  
**Course Code: PCC-EE-313G**

| S.NO. | Course Outcomes                                                                                                                                | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Remember the basic parameter of Electrical Machine and its features and limitations                                                         | L1<br>(Remember)               |
| CO2   | To Understand complete detailed design of all static and rotating Machines and the specified limits for Specific electric and magnetic loading | L2<br>(Understand)             |
| CO3   | To Analyze Operating characteristics of Electrical Machine.                                                                                    | L4<br>(Analyse)                |
| CO4   | To Evaluate different design parameter of all static and rotating Machines.                                                                    | L5<br>(Evaluate)               |
| CO5   | To Synthesize efficient algorithm and make a flow chart for all static and rotating machine                                                    | L6<br>(Synthesize)             |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   | 1   | 2   | 1   |     |     |     |     |      |      |      | 3    | 1    |
| CO2                   | 3     | 2   | 2   | 2   | 2   |     |     |     |     |      |      |      | 3    | 3    |
| CO3                   | 3     | 3   | 2   | 2   | 2   |     |     |     |     |      |      |      | 2    | 2    |
| CO4                   | 3     | 1   | 2   | 2   | 2   |     |     |     |     |      |      |      | 3    | 3    |
| CO5                   | 3     | 1   | 3   | 1   | 1   | 2   | 2   | 1   | 2   | 1    | 1    | 2    | 3    | 2    |

**Course: Control System**  
**Course Code: PCC-EE-305G**

| S.NO. | Course Outcomes                                                          | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge of system transfer function.               | L1<br>(Recall)                 |
| CO2   | To Understand the, knowledge of time and frequency systems.              | L2<br>(Understand)             |
| CO3   | To Apply the basic knowledge state space reparation.                     | L3<br>(Apply)                  |
| CO4   | To Analyze the concept of satiability and its assessment for LTI system. | L4<br>(Analyse)                |
| CO5   | To Design simple feedback controller                                     | L6<br>(Design)                 |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 3   |     | 2   | 2   |     |     |     | 2   | 2    |      | 2    | 3    | 2    |
| CO2                   | 3     | 3   | 3   | 2   | 3   |     |     |     | 2   | 2    |      | 2    | 3    | 1    |
| CO3                   | 3     | 3   | 3   | 2   | 3   |     |     |     | 2   | 2    |      | 2    | 2    | 2    |
| CO4                   | 3     | 3   | 3   | 2   | 3   |     |     |     | 2   | 2    |      | 2    | 3    | 1    |
| CO5                   | 3     | 3   | 3   | 2   | 3   |     |     |     |     | 2    |      | 2    | 3    | 3    |

**Course: Control System Lab**  
**Course Code: LC-EE-307G**

| S.N0. | Course Outcomes                                                                                                           | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | Recall the various measuring instrument.                                                                                  | L1<br>(Recall)                 |
| CO2   | To Understand the, open loop system and close loop system.                                                                | L2<br>(Understand)             |
| CO3   | To Apply the basic knowledge of control action in different device like, industrial PLC control, light intensity control. | L3<br>(Apply)                  |
| CO4   | To Analyze and Evaluate in PID controller                                                                                 | L4<br>(Analyse)                |
| CO5   | To Design the pole –zero configuration in s-plane for the transfer function.                                              | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 2     | 2   |     |     |     |     |     |     |     |      |      | 1    | 3    | 1    |
| CO2                   | 2     | 2   |     |     |     |     |     |     |     |      |      | 1    | 3    | 1    |
| CO3                   | 2     | 2   |     |     |     |     |     |     |     |      |      | 1    | 2    | 0    |
| CO4                   | 2     | 2   |     | 2   |     |     |     |     |     |      |      | 1    | 3    | 1    |
| CO5                   | 2     | 2   |     | 2   |     |     |     |     |     |      |      | 1    | 3    | 1    |

**Course: Computer Aided Electrical Lab**  
**Course Code: LC-EE-315G**

| S.N0. | Course Outcomes                                                                                                  | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall about metlab software.                                                                                 | L1<br>(Recall)                 |
| CO2   | To Write a program to measure the main dimension of an induction motor, synchronous motor                        | L3<br>(Apply)                  |
| CO3   | To Write a program to measure the core and yoke design of transformer                                            | L3<br>(Apply)                  |
| CO4   | To Evaluate main dimension of an induction motor, synchronous motor and DC machine. .                            | L5<br>(Evaluate)               |
| CO5   | To Evaluate main dimension of an induction motor, synchronous motor and DC machine. Transformer using simulation | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

[illegible]

**Course: Microprocessor& Microcontroller Lab**  
**Course Code: LC-EE-311G**

| S.NO. | Course Outcomes                                                                                                           | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the various measuring instrument.                                                                               | L1<br>(Recall)                 |
| CO2   | To Understand the, open loop system and close loop system.                                                                | L2<br>(Understand)             |
| CO3   | To Apply the basic knowledge of control action in different device like, industrial PLC control, light intensity control. | L3<br>(Apply)                  |
| CO4   | To Analyze and Evaluate in PID controller                                                                                 | L4<br>(Analyse)                |
| CO5   | To Design the pole –zero configuration in s-plane for the transfer function.                                              | L6<br>(Design)                 |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   |       | 2   |     |     | 2   |     |     |     |     |      |      |      | 1    | 3    |
| CO2                   | 2     | 3   |     | 2   | 2   |     |     |     |     |      |      |      | 3    | 2    |
| CO3                   | 2     |     |     |     | 2   |     |     |     |     | 3    |      |      | 2    | 1    |
| CO4                   | 2     |     |     | 2   | 2   |     | 3   |     |     | 3    |      |      | 1    | 1    |
| CO5                   |       | 2   |     |     |     |     | 2   |     |     | 2    |      |      | 3    | 1    |



**Course: Power Systems–I Lab**  
**Course Code: LC-EE-303G**

| S.N0. | Course Outcomes                                                                                                  | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall about metlab software.                                                                                 | L1<br>(Recall)                 |
| CO2   | To Write a program to measure the main dimension of an induction motor, synchronous motor                        | L2<br>(Understand)             |
| CO3   | To Write a program to measure the core and yoke design of transformer                                            | L4<br>(Analyse)                |
| CO4   | To Evaluate main dimension of an induction motor, synchronous motor and DC machine. .                            | L5<br>(Evaluate)               |
| CO5   | To Evaluate main dimension of an induction motor, synchronous motor and DC machine. Transformer using simulation | L6<br>(Simulation)             |

### CO PO-PSO Articulation Matrices

[illegible]

**Course: Power plant engineering**  
**Course Code: OEC-EE-07G**

| S.NO. | Course Outcomes                                                                                                                                                                                                                                                            | RBT*- Revised Bloom's Taxonomy |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | Analyze the Structure of materials, imperfection and diffusion mechanism                                                                                                                                                                                                   | L4<br>(Analyse)                |
| CO2   | Interpret the deformation of materials and Illustrate concept of mechanical failure of materials (Fracture, Fatigue and creep).                                                                                                                                            | L2<br>(Illustrate)             |
| CO3   | Define the concept of phase & phase diagram & understand the basic terminologies associated with metallurgy. Label, construction and identification of phase diagrams and reactions.                                                                                       | L2<br>(Understand)             |
| CO4   | Importance of the heat treatment process & types along with concluding significance of properties of microstructure materials. Determining surface hardening phenomenon & its types, concept of hardenability & demonstrate the test used to find hardenability of steels. | L5<br>(Determining)            |
| CO5   | Identify Plain Carbon steels on the basis of properties & uses, effect of alloying elements and choose wear resisting steels for specific applications.                                                                                                                    | L 6<br>(Inentify)              |

### CO PO-PSO Articulation Matrices

[illegible]

**Course: Practical training-1**  
**Course: PT-EE-317G**

| S.NO. | Course Outcomes                                                                                            | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | Participate in the projects in industries during his or her industrial training.                           | L3<br>(Participate)            |
| CO2   | Describe use of advanced tools and techniques encountered during industrial training and visit             | L5<br>(Describe)               |
| CO3   | Interact with industrial personnel and follow engineering practices and discipline prescribed in industry. | L4<br>(Interaction)            |
| CO4   | Develop awareness about general workplace behavior and build interpersonal and team skills                 | L4<br>(Analyse)                |
| CO5   | Prepare professional work reports and presentations..                                                      | L6<br>(Report)                 |

#### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 1     | 1   | 1   |     | 2   | 0   | 2   | 0   | 2   | 1    | 1    | 2    | 1    | 3    |
| CO2                   | 1     | 1   | 1   | 1   |     |     | 2   | 2   | 2   | 2    | 1    | 2    | 2    | 2    |
| CO3                   | 1     | 1   | 1   | 1   | 2   | 0   | 2   | 2   | 2   | 2    | 1    | 1    | 2    | 2    |
| CO4                   | 1     | 1   | 1   | 1   | 2   |     | 2   | 2   | 1   | 2    | 1    | 2    | 2    | 2    |
| CO5                   | 1     | 1   | 1   |     | 2   | 0   | 2   | 2   | 2   | 2    | 2    | 3    | 2    | 2    |

## B.Tech. EE 6th Semester

Course: Advance Electric Drives

Course Code: PEC-EE-18G

| S.NO. | Course Outcomes                                                                               | RBT*- Revised Bloom's Taxonomy |
|-------|-----------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the concept of electric drives.                                                     | L1<br>(Recall)                 |
| CO2   | To Understand the concept of electric drives. And concept of DSP based motion control drives. | L2<br>(Understand)             |
| CO3   | To Apply principle of operation and performance of electric drives                            | L3<br>(Apply)                  |
| CO4   | To Analyze performance characteristics of multi quadrant drives                               | L4<br>(Analyse)                |
| CO5   | To Evaluate the basic knowledge about motoring, generating and breaking mode of AC machine.   | L5<br>(Evaluate)               |

### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 1     | 1   | 1   | 2   | 2   | 1   |     |     |     |      |      | 1    | 2    | 2    |
| CO2                   | 2     | 2   | 2   | 1   | 3   | 2   |     |     |     |      |      |      | 3    | 1    |
| CO3                   | 3     | 1   | 1   | 3   | 1   | 3   |     |     |     |      |      |      | 2    | 2    |
| CO4                   | 2     |     | 2   | 2   | 2   | 2   |     |     |     |      |      |      | 2    | 1    |
| CO5                   | 1     | 3   | 1   | 1   | 1   | 2   | 2   | 3   | 2   | 1    | 1    | 2    | 3    | 3    |

**Course: Digital Signal Processing**  
**Course Code: PEC-EE-04G**

| S.NO. | Course Outcomes                                                                                                 | RBT*- Revised Bloom's Taxonomy |
|-------|-----------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge of digital signal and processing system                                           | L1<br>(Recall)                 |
| CO2   | To Understand the basic the like sampling, interpolation, aliasing and operations, convolution and correlation. | L2<br>(Understand)             |
| CO3   | To mathematical Analysis and application of DFT & FFT.                                                          | L4<br>(Analyse)                |
| CO4   | To Evaluate practical knowledge of signal processing operation by using software.                               | L5<br>(Evaluate)               |
| CO5   | To Design implementation of digital filter.                                                                     | L6<br>(Design)                 |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   | 3   | 3   | 1   |     |     |     |     |      |      |      | 3    | 1    |
| CO2                   | 2     | 2   | 1   | 1   | 2   | 1   |     |     |     |      |      |      | 1    | 3    |
| CO3                   | 1     | 3   | 3   | 2   | 3   |     |     |     |     |      |      |      | 2    | 2    |
| CO4                   | 2     | 2   | 2   | 2   | 2   |     |     |     |     |      |      |      | 2    | 1    |
| CO5                   | 1     | 1   | 3   | 1   | 1   | 2   | 2   | 2   | 3   | 1    | 1    | 2    | 2    | 3    |

Course: Power Electronics  
Course Code: PCC-EE-306G

| S.NO. | Course Outcomes                                                                                                                                                                                                             | RBT*- Revised Bloom's Taxonomy |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge about Power Diode, Power MOSFET, SCR, IGBT, and Power Semiconductor Devices this is essential in concept building in Power electronics subject.                                               | L1<br>(Recall)                 |
| CO2   | To Understand the, Conduction scheme of converter, choppers, commutation technique of SCR, Pulse transformer                                                                                                                | L2<br>(Illustrate)             |
| CO3   | To Apply the basic knowledge of Power Electronics Devices and construct chopper and Inverter circuit.                                                                                                                       | L3<br>(Apply)                  |
| CO4   | To Analyze and Evaluate one, two, three, six and twelve pulse converts, force commutative converter, Modified McMurray bridge inverter, which is applicable to industrial application                                       | L4<br>(Analyse)                |
| CO5   | To Design various switching, protection circuit and drive circuits Inverter, and Chopper circuit with R- Load and Highly inductive load. Step-up chopper for control of various power switches; Phase controlled rectifier, | L6<br>(Design)                 |

#### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 1     | 1   | 1   | 2   | 1   |     |     |     |     |      |      | 1    | 3    | 2    |
| CO2                   | 2     | 1   | 2   | 3   | 2   |     |     |     |     |      |      |      | 3    | 3    |
| CO3                   | 3     | 2   | 2   | 2   | 3   |     |     |     |     |      |      |      | 1    | 3    |
| CO4                   | 1     | 1   | 3   | 2   | 2   |     |     |     |     |      |      |      | 3    | 1    |
| CO5                   | 1     | 3   | 3   | 1   | 3   | 2   | 3   | 1   | 2   | 2    | 3    | 2    | 1    | 3    |

**Course: Electronics Design Lab**  
**Course Code: PCC -EE-310G**

| S.NO. | Course Outcomes                                                                             | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the Noise in electronic systems; Sensors and signal conditioning circuits.        | L4 (Analyse)                   |
| CO2   | To Understand the, CPLDs, and FPGAs, PCB design and layout; System assembly considerations. | L2 (Illustrate)                |
| CO3   | To Apply Embedded systems concept for group projects involving electronic hardware          | L3 (Apply)                     |
| CO4   | To Analyze Interfacing of analog and digital systems                                        | L4 (Analyze)                   |
| CO5   | To Design Embedded systems, Electronic system design employing microcontrollers             | L6 (Design)                    |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 1     | 3   | 1   | 2   | 1   |     |     |     |     |      |      | 1    | 2    | 3    |
| CO2                   | 2     | 2   | 2   | 1   | 2   |     |     |     |     |      |      |      | 1    | 2    |
| CO3                   | 3     | 3   | 1   | 2   | 3   |     |     |     |     |      |      |      | 2    | 1    |
| CO4                   | 1     | 2   | 2   | 3   | 2   |     |     |     |     |      |      | 3    | 3    | 3    |
| CO5                   | 1     | 2   | 1   | 1   | 1   | 2   | 3   | 1   | 3   | 1    | 3    | 3    | 1    | 3    |

**Course: ORGANIZATIONAL BEHAVIOUR**  
**Course Code: HSMC-02G**

| S.N0. | Course Outcomes                                                               | RBT*- Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Identify how effectively and efficiently a manager manages their employees | L3<br>(Identify)               |
| CO2   | To Discuss own behaviour, attitudes and ethical views with students           | L4<br>(Discuss)                |
| CO3   | To Analyse the conflicts within an organization.                              | L4<br>(Analyse)                |
| CO4   | To Analyse how to improve the functional behaviour within an organization     | L4<br>(Analyse)                |
| CO5   | To Develop communication and administrative skills.                           | L6<br>(Developed)              |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 1     | 1   |     |     |     | 1   | 2   | 2   | 3   | 3    | 1    | 3    | 2    | 2    |
| CO2                   | 2     | 2   |     |     |     | 2   | 3   | 1   | 2   | 2    | 2    | 2    | 1    | 3    |
| CO3                   | 3     | 1   |     |     |     | 3   | 1   | 2   | 1   | 1    | 1    | 1    | 2    | 1    |
| CO4                   | 1     | 3   |     |     |     | 2   | 3   | 1   | 2   | 2    | 1    | 2    | 2    | 2    |
| CO5                   | 2     | 1   |     |     |     | 3   | 1   | 2   | 1   | 1    | 1    | 2    | 1    | 3    |



**Course: Power Electronics Lab**  
**Course Code: PCC-EE-308G**

| S.N0. | Course Outcomes                                                              | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------|--------------------------------|
| CO1   | Students will be able to Recall the various experiment instruments.          | L1<br>(Recall)                 |
| CO2   | Student will be able to Study different firing Circuits, Commutation Scheme. | L2<br>(Study)                  |
| CO3   | To Apply the Fully Control Converter Scheme for speed control of motor.      | L3<br>(Apply)                  |
| CO4   | To Analyze Static Characteristics of Power Electronics Device.               | L4<br>(Analyze)                |
| CO5   | To Design various protection Scheme of SCR and Inverter Circuit.             | L6<br>(Design)                 |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 2     | 1   | 1   | 2   | 1   |     |     |     |     |      |      |      | 1    | 3    |
| CO2                   | 2     | 1   | 3   | 3   | 2   |     |     |     |     |      |      |      | 3    | 1    |
| CO3                   | 1     | 2   | 1   | 2   | 2   |     |     |     |     |      |      |      | 1    | 2    |
| CO4                   | 1     | 2   | 1   | 1   | 3   |     |     |     |     |      |      |      | 3    | 1    |
| CO5                   | 3     | 1   | 3   | 1   | 1   | 2   | 3   | 1   | 3   | 1    | 3    | 2    | 2    | 3    |

**Course: Power Systems– II**  
**Course Code: PCC - EE-302G**

| S.N0. | Course Outcomes                                                       | RBT*- Revised Bloom's Taxonomy |
|-------|-----------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall basic of power system economics.                            | L1<br>(Recall)                 |
| CO2   | To Explain the methods to control the voltage, frequency, power flow. | L2<br>(Understand)             |
| CO3   | To Apply the stability constraints in synchronous grid.               | L3<br>(Apply)                  |
| CO4   | To Analyze a power system in steady state by using numerical methods. | L4<br>(Analyze)                |
| CO5   | To Design a stable power system network                               | L6<br>(Design)                 |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 2     | 1   | 1   | 1   | 1   |     |     |     |     |      |      |      | 1    | 1    |
| CO2                   | 3     | 2   | 3   | 1   | 1   |     |     |     |     |      | 1    |      | 2    | 1    |
| CO3                   | 1     | 3   | 2   | 3   | 2   |     |     |     |     |      |      | 2    | 3    | 3    |
| CO4                   | 2     | 1   | 2   | 2   | 2   |     |     |     |     |      |      |      | 1    | 1    |
| CO5                   | 3     | 1   | 3   | 1   | 1   | 2   | 3   | 1   | 3   | 3    | 2    | 3    | 2    | 1    |

Course: Power Systems–II Lab  
Course Code: LC -EE-304G

| S.N0. | Course Outcomes                                                                                                                                                                    | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the various measuring instrument and experimental equipment.                                                                                                             | L1<br>(Recall)                 |
| CO2   | To understand PV modules and their characteristics like open circuit voltage, short circuit current, Fill factor, Efficiency, wind energy, wind speed versus power generation.     | L2<br>(Understand)             |
| CO3   | To Analyze negative and zero sequence reactances of an alternator and fault current for L-G, L-L, L-L-G and L-L-L faults at the terminals of an alternator at very low excitation. | L4<br>(Analyze)                |
| CO4   | To evaluate using software steady state, transient and sub-transient short circuit currents in an alternator                                                                       | L5<br>(Evaluation)             |
| CO5   | To Simulate using software fault in Power System.                                                                                                                                  | L6<br>(Simulation)             |

#### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   | 1   | 1   | 1   |     |     |     |     |      |      |      | 1    | 1    |
| CO2                   | 3     | 2   | 2   | 2   | 2   |     |     |     |     |      | 1    |      | 2    | 3    |
| CO3                   | 2     | 1   | 2   | 3   | 1   |     |     |     |     |      |      | 2    | 1    | 2    |
| CO4                   | 1     | 2   | 3   | 2   | 2   |     |     |     |     |      |      |      | 2    | 1    |
| CO5                   | 1     | 1   | 1   | 3   | 1   | 2   | 3   | 1   | 3   | 1    | 3    | 2    | 3    | 2    |

**Course: VHDL and Digital Design**  
**Course Code: OEC-EE-03G**

| S.NO. | Course Outcomes                                                                                                     | RBT*- Revised Bloom's Taxonomy |
|-------|---------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the construction, principle of combinational and sequential circuit & microcomputer & programmable device | L1<br>(Recall)                 |
| CO2   | To Understand the concept of modeling & simulation & its role in digital evaluation.                                | L2<br>(Understand)             |
| CO3   | To Analyze performance characteristics of microcomputers & combinational and sequential circuit.                    | L4<br>(Analyze)                |
| CO4   | To Evaluate the basic VHDL statements & logical operators.                                                          | L5<br>(Evaluation)             |
| CO5   | To Create Digital circuit such as comparators, multiplexers, demultiplexers, encoders & microcomputers.             | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

[illegible]

## B.Tech. EE 7th Semester

Course: Electronic Principles  
Course Code: OEC-EE-451G

| S.N0. | Course Outcomes                                                                                              | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge about electronic device, digital electronics and display system.               | L1<br>(Recall)                 |
| CO2   | To Understand the knowledge about the behavior of electronic device, digital electronics and display system. | L2<br>(Understand)             |
| CO3   | To Analyze theoretical and practical knowledge of electronic device, digital electronics and display system. | L4<br>(Analyze)                |
| CO4   | To Evaluate the output of digital circuit and electronic circuit.                                            | L5<br>(Evaluation)             |
| CO5   | To Design the display system, digital and electronics devices.                                               | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   | 1   | 2   | 1   |     |     |     |     |      |      |      | 3    | 3    |
| CO2                   | 3     | 2   | 2   | 2   | 2   |     |     |     |     |      |      |      | 3    | 3    |
| CO3                   | 3     | 3   | 2   | 2   | 2   |     |     |     |     |      |      |      | 2    | 2    |
| CO4                   | 3     | 1   | 2   | 2   | 2   |     |     |     |     |      |      |      | 3    | 1    |
| CO5                   | 3     | 1   | 3   | 1   | 1   | 2   | 2   | 1   | 2   | 1    | 1    | 2    | 3    | 2    |

**Course: Microcontroller Based System Design**  
**Course Code: PEC- EE-413G**

| S.NO. | Course Outcomes                                                          | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge of PIC MC                                  | L1<br>(Recall)                 |
| CO2   | To Understand use of interrupts and timers.                              | L2<br>(Understand)             |
| CO3   | To Analysis the functional block of ARM processor.                       | L4<br>(Analysis)               |
| CO4   | To Evaluate on the peripheral dives for data communication and transfer. | L5<br>(Evaluvation)            |
| CO5   | To Design computing plat fame and software engineering problem.          | L6<br>(Design)                 |

## CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     |     |     |     |     |     | 1   |     | 2   |      | 2    |      | 1    | 1    |
| CO2                   | 3     | 3   | 2   | 2   |     |     |     |     | 3   |      |      | 1    | 2    | 2    |
| CO3                   | 3     | 3   | 1   | 3   |     |     |     |     |     |      |      | 1    | 2    | 2    |
| CO4                   | 3     | 3   | 3   | 2   |     |     |     |     | 2   |      | 1    | 1    | 3    | 3    |
| CO5                   | 3     |     | 3   |     | 2   |     |     |     |     |      |      | 1    | 3    | 2    |

**Course: Renewable energy and Distributed Generation**  
**Course Code: OEC-EE-403G**

| S.NO. | Course Outcomes                                                                      | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic of various renewable energy sources.                             | L1<br>(Recall)                 |
| CO2   | To Understand the distributed generation system in autonomous /grid connected modes. | L2<br>(Understand)             |
| CO3   | To Analyze the integrated operation of renewable energy sources.                     | L4<br>(Analysis)               |
| CO4   | To Evaluate the impact of distributed generation on power system..                   | L5<br>(Evaluation)             |
| CO5   | To construct the power electronic interface with grid.                               | L6<br>(Design)                 |

### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     |     |     |     |     |     | 1   |     | 2   |      | 2    |      | 1    | 1    |
| CO2                   | 3     | 3   | 2   | 2   |     |     |     |     | 3   |      |      | 1    | 2    | 2    |
| CO3                   | 3     | 3   | 1   | 3   |     |     |     |     |     |      |      | 1    | 2    | 2    |
| CO4                   | 3     | 3   | 3   | 2   |     |     |     |     | 2   |      | 1    | 1    | 3    | 1    |
| CO5                   | 3     |     | 3   |     | 2   |     |     |     |     |      |      | 1    | 3    | 3    |

**Course: Project Stage-1**  
**Course Code: Proj-EE-423G**

| S.N0. | Course Outcomes                                                             | RBT*- Revised Bloom's Taxonomy |
|-------|-----------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall and finalized the topic.                                          | L1<br>(Recall)                 |
| CO2   | To Study of published literature work on the assigned topic                 | L2<br>(Study)                  |
| CO3   | To Preparing an Action Plan and mathology for conducting the investigation. | L3<br>(Preparation)            |
| CO4   | To Evaluate the project cost.                                               | L5<br>(Evaluate)               |
| CO5   | Student will present the PPT on the concerned Topic.                        | L6<br>(Presentation)           |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 1     | 1   | 1   | 2   | 1   |     |     |     | 2   | 2    |      | 2    | 1    | 3    |
| CO2                   | 2     | 1   | 2   | 1   | 3   |     |     |     | 2   | 1    |      | 3    | 3    | 1    |
| CO3                   | 2     | 3   | 1   | 3   | 2   | 2   |     |     | 2   | 3    | 2    | 2    | 2    | 2    |
| CO4                   | 3     | 2   | 2   | 2   | 3   | 1   |     | 1   | 2   | 1    | 1    | 2    | 3    | 3    |
| CO5                   | 1     | 1   | 3   | 1   | 2   | 2   | 3   | 2   | 2   | 1    | 2    | 1    | 3    | 2    |



Course: Summer internship  
Course Code: INT-EE-425G

| S.N0. | Course Outcomes                                                                                 | RBT*- Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall and enhance the topic assigned in the light of report prepared under project stage-1. | L1<br>(Recall)                 |
| CO2   | To Study of published literature on the assigned topic.                                         | L2<br>(Understand)             |
| CO3   | To Preparing an Action Plan for conducting the investigation.                                   | L3<br>(Apply)                  |
| CO4   | To Evaluate the project and prepare thesis work.                                                | L5<br>(Evaluate)               |
| CO5   | To Present Summer Internship Persentation.                                                      | L5<br>(Persentation)           |

#### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 1     | 1   | 1   | 2   | 1   |     |     |     | 2   | 2    |      | 2    | 1    | 3    |
| CO2                   | 2     | 1   | 2   | 1   | 3   |     |     |     | 2   | 1    |      | 3    | 3    | 1    |
| CO3                   | 2     | 3   | 1   | 3   | 2   | 2   |     |     | 2   | 3    | 2    | 2    | 2    | 2    |
| CO4                   | 3     | 2   | 2   | 2   | 3   | 1   |     | 1   | 2   | 1    | 1    | 2    | 3    | 3    |
| CO5                   | 1     | 1   | 3   | 1   | 2   | 2   | 3   | 2   | 2   | 1    | 2    | 1    | 3    | 2    |

**Course: Power management**  
**Course Code: PEC-EE-401G**

| S.NO. | Course Outcomes                                                                         | RBT*- Revised Bloom's Taxonomy |
|-------|-----------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge about the present power scenario                          | L4<br>(Analyse)                |
| CO2   | To Understand the knowledge about the general layout of various engineering equipments. | L2<br>(Understand)             |
| CO3   | To Analyze theoretical and practical knowledge power utility of Haryana.                | L4<br>(Analyse)                |
| CO4   | To Evaluate the various risk and hazards in the concern area.                           | L5<br>(Evaluate)               |
| CO5   | To Develop the state and central electrical power cooperation                           | L6<br>(Identify and choose)    |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     |     |     |     |     |     |     |     |     |      |      |      | 1    | 1    |
| CO2                   |       | 3   | 2   |     |     |     |     |     |     |      |      |      | 2    | 2    |
| CO3                   | 2     | 3   |     | 2   |     |     |     |     |     |      |      |      | 2    | 2    |
| CO4                   | 3     |     | 2   | 2   |     |     |     |     |     |      |      |      | 2    | 1    |
| CO5                   | 3     | 2   |     |     | 2   | 2   |     |     |     |      |      |      | 2    | 2    |

**Course: Fundamentals of Management**  
**Course Code: HSMC -08G**

| S.N0. | Course Outcomes                                                                     | RBT*- Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Describe the Basics of Management and the role of Management in an organization. | L2 (Understand)                |
| CO2   | To Explain the Importance of Staffing and Training                                  | L2 (Understand)                |
| CO3   | To Discuss the concept of Material management and Inventory Control.                | L2 (Understand)                |
| CO4   | To Analyze the components of Marketing and Advertising.                             | L4 (Analyze)                   |
| CO5   | To Assess the Various sources of Finance and Capital Structure.                     | L5 (Evaluate)                  |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   |       |     |     |     |     | 2   |     | 2   |     | 2    |      | 1    | 3    | 2    |
| CO2                   |       |     |     | 1   |     | 1   |     | 3   |     | 3    |      | 2    | 3    | 2    |
| CO3                   |       |     |     |     | 1   | 3   |     | 2   |     | 2    |      | 2    | 3    | 2    |
| CO4                   |       |     |     | 2   |     | 2   |     | 2   | 1   | 1    |      | 2    | 2    | 3    |
| CO5                   |       |     |     |     |     |     | 1   | 1   |     | 1    |      | 2    | 1    | 1    |

## EE 8th Semester

**Course: General proficiency**

**Course Code: GP-EE-426G**

| S.N0. | Course Outcomes                                                                                        | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Express a sense of professionalism                                                                  | L1<br>(Recall)                 |
| CO2   | Students will be able to Practice and improve their communications skill.                              | L2<br>(Illustrate)             |
| CO3   | To Analyze his/her overall personal developments.                                                      | L3<br>(Apply)                  |
| CO4   | To Develop his/her personality in terms of quality such as reciving, responding, attitude and outlook. | L4<br>(Analyse)                |
| CO5   | To Evaluate his /her efforts on the basic of performance/achievements in different walks of life.      | L5<br>(Evaluate)               |

### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   | 1   | 3   | 2   | 1   |     | 1   |     | 2    |      | 1    | 3    | 1    |
| CO2                   | 1     | 2   | 2   | 2   | 2   | 3   |     | 2   |     |      |      |      | 1    | 2    |
| CO3                   | 1     | 2   | 1   | 3   | 1   | 1   |     | 1   |     |      | 1    | 2    | 1    | 2    |
| CO4                   | 3     | 3   | 2   | 2   | 2   | 3   |     | 3   | 1   |      | 2    | 3    | 3    | 3    |
| CO5                   | 1     | 2   | 3   | 3   | 3   | 2   |     | 2   | 2   |      | 1    | 2    | 1    | 2    |

**Course: INTELLIGENT INSTRUMENTATION FOR ENGINEERS**  
**Course Code: OEC-ECE-452-G**

| S.N0. | Course Outcomes                                                                                                                                                         | RBT*- Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the concept of intelligent instrumentation & interfacing of instruments with computer.                                                                        | L4<br>(Analyse)                |
| CO2   | To Explain the construction, principle of operation and performance of serial & parallel communication line & star networks and low pass filters and hinh pass filters. | L2<br>(Illustrate)             |
| CO3   | To Analyze performance characteristics of intelligent instrumentation and spike filters and low and high pass filters.                                                  | L4<br>(Analyse)                |
| CO4   | To Evaluate the performance of low pass filter and high pass filter & star networks and bus networks.                                                                   | L5<br>(Evaluate)               |
| CO5   | To Design the intelligent instrumentation and low pass filter and high pass filter.                                                                                     | L6<br>(Design)                 |

**CO PO-PSO Articulation Matrices**

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 2     | 1   | 1   | 1   | 1   |     |     |     |     |      |      | 1    | 3    | 3    |
| CO2                   | 1     | 2   | 1   | 2   | 2   |     |     |     |     |      |      |      | 3    | 2    |
| CO3                   | 3     | 3   | 2   | 1   | 2   |     |     |     | 1   |      | 2    |      | 2    | 2    |
| CO4                   | 1     | 1   | 2   | 2   | 2   |     |     |     | 3   |      |      | 2    | 3    | 3    |
| CO5                   | 1     | 2   | 3   | 1   | 1   | 3   | 1   |     | 1   |      |      | 2    | 3    | 1    |

Course: Project stage-2  
Course Code: PROJ-EE-422G

| S.NO. | Course Outcomes                                                                                 | RBT*- Revised Bloom's Taxonomy |
|-------|-------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall and enhance the topic assigned in the light of report prepared under project stage-1. | L1<br>(Recall)                 |
| CO2   | To review and Explain of the approach to the problem relating to assigned topic.                | L2<br>(Illustrate)             |
| CO3   | To review and Explain of the approach to the problem relating to assigned topic.                | L3<br>(Apply)                  |
| CO4   | To Evaluate the project and prepare thesis work                                                 | L4<br>(Analyse)                |
| CO5   | To Modeling /Simulation/Design/Problem Solving Experiment as needed                             | L5<br>(Evaluate)               |

#### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 1     | 1   | 1   | 2   | 1   |     |     |     | 2   | 2    |      | 2    | 1    | 3    |
| CO2                   | 2     | 1   | 2   | 1   | 3   |     |     |     | 2   | 1    |      | 3    | 3    | 1    |
| CO3                   | 1     | 3   | 1   | 3   | 2   | 2   |     |     | 2   | 3    | 2    | 2    | 2    | 2    |
| CO4                   | 3     | 2   | 2   | 2   | 3   | 1   |     | 1   | 2   | 1    | 1    | 2    | 3    | 3    |
| CO5                   | 1     | 1   | 1   | 1   | 2   | 2   | 3   | 2   | 2   | 1    | 2    | 1    | 3    | 2    |

**Course Code: PEC-EE-402G**

### CO PO-PSO Articulation Matrices

[illegible]

Course: Seminar  
Course Code: SEM-EE-424G

| S.N0. | Course Outcomes                                                                                        | RBT*- Revised Bloom's Taxonomy |
|-------|--------------------------------------------------------------------------------------------------------|--------------------------------|
| CO1   | To Express a sense of professionalism                                                                  | L1<br>(Recall)                 |
| CO2   | To Practice and improve their communications skill.                                                    | L2<br>(Illustrate)             |
| CO3   | To Analyze his/her overall personal developments.                                                      | L3<br>(Apply)                  |
| CO4   | To Develop his/her personality in terms of quality such as reciving, responding, attitude and outlook. | L4<br>(Analyse)                |
| CO5   | To Evaluate his /her efforts on the basic of performance/achievements in different walks of life.      | L5<br>(Evaluate)               |

#### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   | 3   | 3   | 3   | 2   | 2   | 1   | 2   | 2    | 1    |      | 2    | 2    |
| CO2                   | 2     | 1   | 3   | 2   | 2   | 2   | 2   | 3   | 2   | 1    | 2    | 2    | 3    | 3    |
| CO3                   | 1     | 3   | 2   | 2   | 3   | 2   | 2   | 1   | 1   | 3    | 1    | 2    | 1    | 2    |
| CO4                   | 3     | 2   | 1   | 1   | 2   | 1   | 2   | 1   | 2   | 1    | 2    | 1    | 3    | 3    |
| CO5                   | 3     | 3   | 3   | 3   | 3   | 2   | 2   | 1   | 2   | 1    | 1    | 2    | 3    | 1    |



**Course: Solar Thermal Applications**  
**Course Code: OEC- EE-402G**

| S.N0. | Course Outcomes                                                        | RBT*- Revised Bloom's Taxonomy |
|-------|------------------------------------------------------------------------|--------------------------------|
| CO1   | To Recall the basic knowledge of solar thermal energy                  | L4<br>(Analyse)                |
| CO2   | To Understand concept about solar energy systems and devices.          | L2<br>(Understand)             |
| CO3   | To Apply the concept about storage of solar energy system and devices. | L3<br>(Apply)                  |
| CO4   | To Analysis solar system in detail along with practical case studies.  | L4<br>(Analyse)                |
| CO5   | To installation and Design the solar grid thermal application.         | L6<br>(Design)                 |

#### CO PO-PSO Articulation Matrices

| Course Outcomes (Cos) | (POs) |     |     |     |     |     |     |     |     |      |      |      | PSOs |      |
|-----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                   | 3     | 1   | 1   | 1   | 1   |     |     |     |     |      |      |      | 3    | 3    |
| CO2                   | 2     | 2   | 3   | 2   | 2   |     |     |     |     |      |      | 1    | 2    | 1    |
| CO3                   | 3     | 1   | 1   | 3   | 3   |     |     |     |     |      |      |      | 1    | 2    |
| CO4                   | 2     | 2   | 1   | 2   | 2   |     |     |     |     |      |      | 3    | 2    | 3    |
| CO5                   | 1     | 1   | 2   | 1   | 1   | 2   | 3   | 1   | 3   | 1    | 2    | 2    | 3    | 1    |