

Government College of Engineering, Salem - 11
Department of Electronics and Communication Engineering
COs - POs and PSO Mapping
Course Articulation Matrix – 22 Regulation

| Semester - I | | | | | | | | | | | | | | | | |
|--------------------------------|--|------------------|---|---|-----|---|---|---|---|---|----|----|-----|---------------------------|---|-----|
| 22EN101- Communicative English | | | | | | | | | | | | | | | | |
| | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| Course Outcomes | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| CO1 | comprehend the main ideas, key details and inferred meanings of technical texts | - | - | - | 1 | - | - | - | - | 1 | 3 | - | 1 | - | - | 1 |
| CO2 | use language effectively at technical and professional contexts | - | - | - | 1 | - | - | - | - | 1 | 3 | - | 2 | - | - | 2 |
| CO3 | apply the academic and functional writing skills in formal and informal communicative contexts | - | - | - | 2 | - | - | - | - | 1 | 3 | - | 1 | - | - | 1 |
| CO4 | interpret pictorial representation of statistical data and charts | - | - | - | 3 | - | - | - | - | 1 | 3 | - | 1 | - | - | 1 |
| Average | | - | - | - | 1.8 | - | - | - | - | 1 | 3 | - | 1.3 | - | - | 1.3 |

Semester - I

22MA101-Matrices, Calculus and Ordinary Differential Equation

| | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
|-----------------|--|------------------|---|---|---|---|---|---|---|---|----|----|----|---------------------------|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| Course Outcomes | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| CO1 | Learn the fundamental knowledge of Matrix theory. | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | 2 | - | - |
| CO2 | Use both the limit definition and rules of differentiation to differentiable functions. | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | 2 | - | - |
| CO3 | Apply differentiation to solve maxima and minima problems. | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | 2 | - | - |
| CO4 | Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to a change of order and change of variables. | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | 2 | - | - |
| CO5 | Apply various techniques in solving differential equations. | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | 2 | - | - |
| Average | | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | 2 | - | - |

| Semester - I | | | | | | | | | | | | | | | | |
|--|--|------------------|-----|-----|-----|---|---|---|---|---|----|----|-----|---------------------------|---|-----|
| 22PH102 -Materials Science for Engineering | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| CO1 | Understanding the concept of conduction in materials and its carrier concentration. | 3 | 2 | 1 | - | - | - | 1 | - | - | - | - | 1 | 2 | 2 | - |
| CO2 | The basics of semiconductor and variation of Fermi level with respect to different parameters. | 3 | 2 | 1 | - | 1 | 1 | 1 | 1 | - | - | - | 2 | - | - | 1 |
| CO3 | Analyse the various mechanism involved in dielectric polarization and its applications. | 3 | 3 | 1 | - | - | 1 | 1 | 1 | - | - | - | 1 | 1 | - | - |
| CO4 | Applying the concept of superconductor in magnetic levitation and SQUID. | 3 | 3 | 2 | 1 | 2 | 1 | - | - | - | - | - | 2 | - | 2 | - |
| CO5 | Synthesis of modern engineering materials by using various techniques and its properties | 2 | 2 | 2 | 2 | 3 | 1 | - | 1 | - | - | - | 2 | - | - | 2 |
| Average | | 2.8 | 2.4 | 1.4 | 1.5 | 2 | 1 | 1 | 1 | - | - | - | 1.6 | 1.5 | 2 | 1.5 |

| Semester - I | | | | | | | | | | | | | | | | | |
|-------------------------------|---|------------------|-----|---|-----|---|---|---|---|---|----|----|----|---------------------------|-----|-----|-----|
| 22CY101-Engineering Chemistry | | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | |
| CO1 | Recall the basic principles of spectroscopy and their applications | 3 | 3 | - | 3 | - | - | - | - | - | - | - | - | - | 3 | 1 | 1 |
| CO2 | Paraphrase the different methods for water analysis & purification and Nanomaterial & its applications | 3 | 2 | - | 1 | - | 2 | - | - | - | - | - | - | - | 3 | 1 | 1 |
| CO3 | Apply the various adsorption techniques and basic knowledge of Phase equilibria | 3 | 1 | - | 1 | - | - | - | - | - | - | - | - | - | 2 | 1 | 1 |
| CO4 | Integrate the principles of electrochemistry, electrochemical cells, corrosion, and its control | 2 | 1 | - | 1 | - | 2 | - | - | - | - | - | - | - | 2 | 3 | 2 |
| CO5 | Assess the basis of polymer preparations & applications and enhancement of the quantity & quality of fuels. | 3 | 2 | - | 3 | - | 2 | - | - | - | - | - | - | - | 1 | 1 | 1 |
| Average | | 2.8 | 1.8 | - | 1.8 | - | 2 | - | - | - | - | - | - | - | 2.2 | 1.4 | 1.2 |

| Semester -I | | | | | | | | | | | | | | | | | |
|--|---|------------------|---|---|---|---|---|---|---|---|----|----|----|---------------------------|---|---|---|
| 22CS101- Problem Solving and C Programming | | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | |
| CO1 | Explain the concepts of C programming and roles of system software in programming | 2 | 1 | 3 | - | - | - | - | - | - | - | - | - | 3 | 1 | - | - |
| CO2 | Use general problem-solving techniques to develop solutions to problems | 2 | 1 | 3 | - | 2 | - | - | - | - | - | - | - | 3 | 2 | - | - |
| CO3 | Apply the concepts of C programming to develop solutions by writing C programs | 2 | 1 | 3 | - | 2 | - | - | - | - | - | - | - | 3 | 2 | - | - |
| Average | | 2 | 1 | 3 | - | 2 | - | - | - | - | - | - | - | 3 | 2 | - | - |

| Semester - I | | | | | | | | | | | | | | | | | |
|---|--|------------------|-----|---|---|---|---|---|---|---|----|----|----|---------------------------|-----|---|---|
| 22CS102- Computer Practice and C Programming Laboratory | | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | |
| CO1 | Demonstrate the usage of features supported by word processing applications. | - | - | - | - | - | - | - | - | - | - | 3 | - | - | 1 | - | - |
| CO2 | Demonstrate the usage of features supported by spread sheet applications. | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - |
| CO3 | Apply general programming techniques to develop digital solutions to problems | 2 | 3 | 3 | - | - | - | - | - | - | - | - | - | 3 | 2 | - | - |
| CO4 | Implement solutions developed with general programming techniques in C programming language. | 1 | 1 | 1 | - | - | - | - | - | - | - | - | - | 3 | 3 | - | - |
| Average | | 1.6 | 2.3 | 2 | - | - | - | - | - | - | - | 3 | - | 3 | 1.7 | - | - |

| Semester - II | | | | | | | | | | | | | | | | | |
|--|--|------------------|-----|---|-----|---|---|---|---|---|----|----|----|---------------------------|-----|---|---|
| 22MA03- Linear Algebra, Partial Differential Equations and Vector Calculus | | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | |
| 1 | Use the concepts of vector space and linear transformations. | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | - | 2 | - | - |
| 2 | Illustrate the concept of inner product spaces in orthogonalization. | 3 | 2 | - | 3 | - | - | - | - | - | - | - | - | - | 2 | - | - |
| 3 | Solve various types of partial differential equations in engineering problems. | 3 | 1 | - | 2 | - | - | - | - | - | - | - | - | - | 2 | - | - |
| 4 | Apply the knowledge of Laplace transforms method to solve second order differential equations. | 3 | 1 | - | 3 | - | - | - | - | - | - | - | - | - | 3 | - | - |
| 5 | Use Gauss, Stokes and Green's theorems for the verification of line, surface and volume integrals. | 3 | 1 | - | 2 | - | - | - | - | - | - | - | - | - | 2 | - | - |
| Average | | 3 | 1.4 | - | 2.4 | - | - | - | - | - | - | - | - | - | 2.2 | - | - |

| Semester - II | | | | | | | | | | | | | | | | |
|-------------------------------------|---|------------------|-----|-----|-----|---|---|---|---|---|----|----|-----|---------------------------|---|-----|
| 22PH2010 Physics – Electromagnetism | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Understand the concepts of electrostatics, electrical potential, and their applications. | 2 | 3 | 1 | 1 | - | 1 | - | - | - | - | - | 1 | 1 | - | - |
| 2 | Interpret the concepts of dielectrics, capacitance and apply Poisson's or Laplace's equations to various electrostatic problems | 3 | 2 | 2 | 3 | - | 1 | - | - | - | - | - | 2 | 2 | 1 | 1 |
| 3 | Apply the concepts of magneto statics, magnetic fields in matter and their application. | 2 | 2 | 1 | 1 | - | - | - | - | - | - | - | 1 | 1 | - | - |
| 4 | Apply the concepts of Faraday's laws, Ampere's Law, Maxwell's Equation. | 3 | 3 | 2 | 2 | - | 1 | - | - | - | - | - | 2 | 2 | 1 | 1 |
| 5 | The concepts of electromagnetic waves and Poynting vector. | 3 | 2 | 2 | 2 | - | - | - | - | - | - | - | 2 | 1 | - | 2 |
| Average | | 2.6 | 2.4 | 1.6 | 1.8 | - | 1 | - | - | - | - | - | 1.6 | 1.4 | 1 | 1.3 |

| Semester - II | | | | | | | | | | | | | | | | |
|---------------------------------|--|------------------|---|-----|---|---|-----|---|-----|---|----|----|----|---------------------------|---|-----|
| 22HS2010 Universal Human Values | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Become more aware of themselves, and their surroundings (family, society, nature) and become more responsible in life | - | - | 1 | - | - | 1 | - | 2 | - | 1 | - | 3 | 2 | - | 1 |
| 2 | Handle problems with sustainable solutions, while keeping human relationships and human nature in mind | - | - | 1 | - | - | 3 | - | 1 | - | 1 | - | 3 | 1 | - | 1 |
| 3 | Become sensitive to their commitment towards what they have understood (human values, human relationship and human society) | - | - | 1 | - | - | 2 | - | 1 | - | 1 | - | 3 | 1 | - | 2 |
| 4 | Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction. | - | - | 2 | - | - | 1 | - | 1 | - | 1 | - | 3 | 1 | - | 1 |
| Average | | - | - | 1.3 | - | - | 1.8 | - | 1.3 | - | 1 | - | 3 | 1.3 | - | 1.3 |

| Semester - II | | | | | | | | | | | | | | | | |
|---|--|------------------|-----|-----|-----|-----|---|-----|---|---|----|----|-----|---------------------------|-----|-----|
| 22EE2010 Principles of Electrical Engineering | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Analyse DC and AC circuits. | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 1 |
| 2 | Apply electrical circuit theorems to DC circuits. | 3 | 3 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 2 |
| 3 | Discuss the concepts and working of two-winding and auto-transformers. | 3 | 3 | 3 | 3 | 2 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 |
| 4 | Explain the working principles of DC and AC Electrical Machines. | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 2 |
| 5 | To choose components of Low Voltage Electrical Installations | 2 | 3 | 3 | 3 | 3 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 |
| Average | | 2.4 | 2.6 | 2.4 | 2.2 | 2.2 | 1 | 2.6 | 1 | 1 | 1 | 1 | 1.6 | 2.2 | 2.6 | 1.4 |

| Semester - II | | | | | | | | | | | | | | | | | |
|--|--|------------------|---|---|---|---|---|---|---|---|----|----|----|---------------------------|---|---|---|
| 22ME1010 Engineering Graphics and Design | | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | |
| 1 | Familiarize with the fundamentals and standards of engineering graphics. | 3 | 1 | - | - | - | - | - | - | - | - | - | - | - | 3 | 1 | - |
| 2 | Ability to understand the fundamental concepts of projection of points, lines and planes. | 3 | 1 | - | - | - | - | - | - | - | - | - | - | - | 3 | 1 | - |
| 3 | Project the solids and section of solids. | 3 | 1 | - | - | - | - | - | - | - | - | - | - | - | 3 | 1 | - |
| 4 | Familiarize and develop the lateral surfaces of solids | 3 | 1 | - | - | - | - | - | - | - | - | - | - | - | 3 | 1 | - |
| 5 | Visualize and project the orthographic, isometric and perspective sections of simple solids. | 3 | 1 | - | - | - | - | - | - | - | - | - | - | - | 3 | 1 | - |
| Average | | 3 | 1 | - | - | - | - | - | - | - | - | - | - | - | 3 | 1 | - |

| Semester - II | | | | | | | | | | | | | | | | |
|---|--|------------------|---|---|-----|---|---|---|---|---|----|----|----|---------------------------|---|-----|
| 22EN102- Professional Skills Laboratory | | | | | | | | | | | | | | | | |
| | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| Course Outcomes | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | To read passages fluently with good pronunciation | - | - | - | 1 | - | - | - | - | 2 | 3 | - | 1 | - | - | 1 |
| 2 | To develop an expressive style of reading | - | - | - | 1 | - | - | - | - | 2 | 3 | - | 1 | - | - | 1 |
| 3 | To make effective oral presentations in technical and general contexts | - | - | - | 2 | - | - | - | - | 2 | 3 | - | 1 | - | - | 1 |
| 4 | To excel at professional oral communication | - | - | - | 2 | - | - | - | - | 2 | 3 | - | 1 | - | - | 3 |
| Average | | - | - | - | 1.5 | - | - | - | - | 2 | 3 | - | 1 | - | - | 1.5 |

| Semester - II | | | | | | | | | | | | | | | | |
|-----------------------------|--|------------------|---|---|-----|---|---|---|---|-----|----|----|-----|---------------------------|---|---|
| 22PH103- Physics Laboratory | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Handle different measuring instruments and to measure different parameters. | 3 | 2 | - | 3 | 3 | - | - | - | 3 | 1 | - | 2 | 1 | 1 | 1 |
| 2 | Calculate the important parameters and to arrive at the final result based on the experimental measurements. | 3 | 2 | - | 2 | 1 | - | - | - | 2 | - | - | 1 | 1 | 1 | 1 |
| Average | | 3 | 2 | - | 2.5 | 2 | - | - | - | 2.5 | 1 | - | 1.5 | 1 | 1 | 1 |

| Semester - II | | | | | | | | | | | | | | | | |
|-------------------------------|--|------------------|-----|---|---|---|---|---|---|---|----|----|----|---------------------------|---|---|
| 22CY102- Chemistry Laboratory | | | | | | | | | | | | | | | | |
| | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| Course Outcomes | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | To summarize the applicability of the practical skill gained in various fields. | 1 | 1 | - | 3 | - | - | - | - | - | - | - | - | 2 | - | - |
| 2 | To calculate the composition of brass quantitatively and the molecular weight of polymers. | 1 | 2 | - | 3 | - | - | - | - | - | - | - | - | 2 | - | - |
| 3 | To understand the principle and applications of conductometric and pH titrations, spectrometer, and potentiometric titrations. | 2 | 2 | - | 3 | - | - | - | - | - | - | - | - | 2 | - | - |
| Average | | 1.3 | 1.7 | - | 3 | - | - | - | - | - | - | - | - | 2 | - | - |

| Semester - II | | | | | | | | | | | | | | | | |
|--|---|------------------|---|-----|-----|---|---|-----|---|-----|-----|-----|----|---------------------------|-----|-----|
| 22EE202- Principles of Electrical Engineering Laboratory | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Discuss the working of measuring instruments and electrical machines. | 1 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 1 |
| 2 | Apply fundamental laws and theorems to electric circuits. | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 3 | 2 |
| 3 | Estimate parameters in single phase and three phase AC circuits. | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 3 | 1 |
| 4 | Analyze resonance in single phase AC circuits. | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 2 |
| 5 | Judge the steady state responses of single phase AC circuits. | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 1 |
| Average | | 1 | 2 | 1.8 | 1.6 | 1 | 1 | 1.6 | 1 | 1.2 | 1.6 | 1.8 | 2 | 2.4 | 2.8 | 1.4 |

| Semester -III | | | | | | | | | | | | | | | | | |
|---|---|------------------|---|---|---|---|---|---|---|---|----|----|----|---------------------------|---|---|---|
| 22MA304- Fourier Series, Complex Variables and Transforms | | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | |
| 1 | Understand the characteristics of diodes and special semiconductor devices. | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | - | 2 | - | - |
| 2 | Design and analyze clipper, clamper and power supply circuits. | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | - | 2 | - | - |
| 3 | Acquire knowledge on working principles, characteristics and applications of BJT and FET. | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | - | 2 | - | - |
| 4 | Analyse the frequency response characteristics of amplifiers. | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | - | 2 | - | - |
| 5 | Design and analyze power and feedback amplifiers and derive their performance specifications. | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | - | 2 | - | - |
| Average | | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | - | 2 | - | - |

| Semester -III | | | | | | | | | | | | | | | | |
|--|---|------------------|-----|-----|-----|---|---|---|---|---|----|----|----|---------------------------|-----|---|
| 22EC301 - Semiconductor Devices and Circuits | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Understand the characteristics of diodes and special semiconductor devices. | 1 | 3 | 1 | 2 | - | - | - | - | - | - | - | - | 1 | 1 | 1 |
| 2 | Design and analyze clipper, clamper and power supply circuits. | 3 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 2 | 2 | 1 |
| 3 | Acquire knowledge on working principles, characteristics and applications of BJT and FET. | 3 | 2 | 2 | 3 | - | - | - | - | - | - | - | - | 1 | 1 | 1 |
| 4 | Analyse the frequency response characteristics of amplifiers. | 2 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 1 | 2 | 1 |
| 5 | Design and analyze power and feedback amplifiers and derive their performance specifications. | 2 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 2 | 1 | 1 |
| Average | | 2.2 | 2.8 | 1.8 | 2.8 | - | - | - | - | - | - | - | - | 1.4 | 1.4 | 1 |

| Semester -III | | | | | | | | | | | | | | | | |
|--------------------------------|--|------------------|-----|-----|-----|-----|---|-----|-----|---|----|----|----|---------------------------|-----|---|
| 22EC302- Digital System Design | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Understand the number system and the functioning of logic gates with various logic families. | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | - | - | - | - | 2 | 1 | - |
| 2 | Design and analyse combinational logic circuits and Logic gates. | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | - | - | - | 3 | 2 | - |
| 3 | Design the sequential logic circuits using Flip flops | 2 | 2 | 3 | 3 | 2 | 1 | 2 | 1 | 1 | - | - | - | 2 | 2 | - |
| 4 | Design and analyse asynchronous sequential logic circuits | 2 | 1 | 2 | 1 | 2 | 2 | 3 | 1 | - | - | - | - | 2 | 1 | - |
| 5 | Understand the concepts of memories and PLDs and implementation of circuits using memory and PLDs. | 2 | 1 | 2 | 1 | 3 | 2 | 1 | 2 | - | - | - | - | 3 | 2 | - |
| Average | | 2.4 | 1.8 | 2.2 | 1.8 | 2.6 | 2 | 2.2 | 1.4 | 1 | - | - | - | 2.4 | 1.6 | - |

| Semester -III | | | | | | | | | | | | | | | | |
|---------------------------------------|---|------------------|-----|---|---|---|---|---|---|---|----|----|----|---------------------------|---|---|
| 22EC303- Network Theory and Synthesis | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Analyse the electric circuit using best suited network theorem | 3 | 3 | - | 2 | 1 | - | - | - | - | - | - | - | 3 | 1 | - |
| 2 | Apply the knowledge of Fourier Series, Fourier Transform and Laplace Transform to analyse the circuit | 3 | 3 | - | 2 | 1 | - | - | - | - | - | - | - | 3 | 1 | - |
| 3 | Understand and analyse the resonance behaviour of circuit and apply the knowledge to design band limited circuits according to the application. | 3 | 3 | - | 2 | 1 | - | - | - | - | - | - | - | 3 | 1 | - |
| 4 | Analyse the linear network parameters, and their interaction with other networks. | 3 | 3 | - | 2 | 1 | - | - | - | - | - | - | - | 3 | 1 | - |
| 5 | Design RLC from a given differential equation and can say the feasibility of the design. | 3 | 1 | 1 | 2 | 1 | - | - | - | - | - | - | - | 3 | 1 | - |
| Average | | 3 | 2.6 | 1 | 2 | 1 | - | - | - | - | - | - | - | 3 | 1 | - |

| Semester -III | | | | | | | | | | | | | | | | |
|---|--|------------------|---|-----|-----|---|---|---|---|---|----|-----|----|---------------------------|-----|-----|
| 22EC304-Transmission Lines and Waveguides | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Analyse the propagation of signals through transmission lines. | 1 | 3 | 2 | 2 | - | - | - | - | - | - | 2 | - | 2 | 3 | 2 |
| 2 | Calculate reflection and transmission coefficients, standing wave ratio and power for transmission lines using HF applications. | 1 | 3 | 2 | 3 | - | - | - | - | - | - | 2 | - | 2 | 3 | 2 |
| 3 | Compute various parameters for loaded transmission lines using Smith chart and acquire knowledge of stub matching in Transmission Lines. | 1 | 3 | 3 | 3 | - | - | - | - | - | - | 3 | - | 1 | 3 | 1 |
| 4 | Analyse the field components of different waveguides based on various modes of E and H filed. | 1 | 3 | 3 | 3 | - | - | - | - | - | - | 3 | - | 2 | 2 | 2 |
| 5 | Understand the concept of planar transmission lines and analyse its field distribution. | 1 | 3 | 3 | 3 | - | - | - | - | - | - | 3 | - | 2 | 2 | 2 |
| Average | | 1 | 3 | 2.6 | 2.8 | - | - | - | - | - | - | 2.6 | - | 2 | 2.6 | 1.8 |

| Semester -III | | | | | | | | | | | | | | | | |
|-------------------------------|--|------------------|-----|-----|---|---|---|---|---|---|----|----|----|---------------------------|-----|---|
| 22EC305- Analog Communication | | | | | | | | | | | | | | | | |
| | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| Course Outcomes | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Gain knowledge on the principles of AM and FM communication systems. | 2 | 1 | 3 | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 |
| 2 | Ability to design AM and FM receiver. | 2 | 1 | 3 | - | - | - | - | - | - | - | - | - | 1 | 2 | 1 |
| 3 | The exposure to the sources of noise and its effects in Communication systems. | 2 | 2 | 2 | 1 | - | - | - | - | - | - | - | - | 1 | 2 | 1 |
| 4 | Ability to analyze the performance of receiver in the presence of noise. | 2 | 2 | 2 | 1 | - | - | - | - | - | - | - | - | 1 | 2 | 1 |
| 5 | Ability to measure the capacity of a channel based on the information theory. | 3 | 1 | 1 | - | - | - | - | - | - | - | - | - | 1 | 2 | 1 |
| Average | | 2.2 | 1.4 | 2.2 | 1 | - | - | - | - | - | - | - | - | 1 | 1.8 | 1 |

| Semester -III | | | | | | | | | | | | | | | | |
|------------------------------|---|------------------|---|---|---|---|---|---|---|---|----|----|----|---------------------------|---|---|
| 22MC301- Indian Constitution | | | | | | | | | | | | | | | | |
| | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| Course Outcomes | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Understand the emergence and evolution of the Indian Constitution | - | - | - | - | - | - | - | - | 1 | 1 | - | 1 | - | - | - |
| 2 | Explain the key concepts of Indian Political System | - | - | - | - | - | - | - | - | 1 | 1 | - | 1 | - | - | - |
| 3 | Describe the role of constitution in a democratic society. | - | - | - | - | - | - | - | - | 1 | 1 | - | 1 | - | - | - |
| 4 | Present the structure and functions of the Central and State Governments, the Legislature and the Judiciary | - | - | - | - | - | - | - | - | 1 | 1 | - | 1 | - | - | - |
| Average | | - | - | - | - | - | - | - | - | 1 | 1 | - | 1 | - | - | - |

| Semester -III | | | | | | | | | | | | | | | | |
|------------------------------|---|------------------|---|---|---|---|---|---|---|---|----|----|----|---------------------------|---|---|
| 22MCIN02- Innovation Sprints | | | | | | | | | | | | | | | | |
| | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| Course Outcomes | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Identify real-world problems | - | 3 | - | - | - | 2 | 1 | - | 2 | - | - | - | - | - | 2 |
| 2 | Apply the challenge curation techniques to real-world problems. | - | 3 | - | 2 | - | - | - | - | 2 | - | - | - | - | - | 2 |
| 3 | Analyze the problems and generate solutions to address the challenges | - | - | 3 | 2 | - | - | - | - | 2 | - | - | - | - | - | 2 |
| 4 | Build solutions using prototyping tools & techniques | 2 | - | 3 | - | - | - | - | 1 | 2 | - | - | - | - | - | 2 |
| 5 | Develop an innovation pitch to effectively communicate the idea to solve the identified problem | - | - | - | - | - | - | - | - | 2 | 3 | - | - | - | - | 2 |
| Average | | 2 | 3 | 3 | 2 | - | 2 | 1 | 1 | 2 | 3 | - | - | - | - | 2 |

| Semester -III | | | | | | | | | | | | | | | | | |
|--|--|------------------|-----|-----|---|---|-----|---|---|---|----|----|----|---------------------------|---|---|---|
| 22NC301 -NCC course-II (Only for NCC Students) | | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | |
| 1 | Acquired knowledge about social and legal responsibilities. | 3 | 1 | - | - | - | - | - | - | - | - | - | - | - | 3 | 1 | 1 |
| 2 | Understand the adventure activities and verbal training on defense examinations. | 3 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | - | 3 | 2 | 1 |
| 3 | Understand the technical knowledge on aero engines and map reading. | 3 | 2 | 3 | 1 | - | 2 | - | - | - | - | - | - | - | 3 | 2 | 1 |
| 4 | Understand the structure and control of an aircraft. | 3 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | - | 3 | 2 | 1 |
| 5 | Understand and learn the importance of avionic instruments on aircraft control. | 3 | - | - | - | - | 1 | - | - | - | - | - | - | - | 3 | 3 | 1 |
| Average | | 3 | 2.2 | 2.3 | 2 | - | 1.5 | - | - | - | - | - | - | - | 3 | 2 | 1 |

| Semester -III | | | | | | | | | | | | | | | | |
|--|--|------------------|---|-----|---|---|---|---|---|---|----|----|----|---------------------------|-----|---|
| 22EC306- Semiconductor Devices and Circuits Laboratory | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Analyze the characteristics of diodes and transistors. | 2 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | - | 1 | 1 | 1 |
| 2 | Design electronic circuits such as rectifiers and analyse their performance. | 3 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | - | 1 | 2 | 1 |
| 3 | Analyze the frequency response of small signal and power amplifiers using discrete components. | 3 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | - | 2 | 2 | 1 |
| 4 | Design and analyze the frequency response of feedback amplifiers. | 3 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | 1 | 1 | 1 |
| 5 | Implement electronic circuits and test their performance. | 3 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | 2 | 2 | 1 |
| Average | | 2.8 | 3 | 2.4 | 2 | 2 | - | - | - | - | - | - | - | 1.4 | 1.6 | 1 |

| Semester -III | | | | | | | | | | | | | | | | |
|------------------------------------|--|------------------|---|-----|---|-----|-----|-----|-----|---|----|----|----|---------------------------|-----|---|
| 22EC307- Digital System Design Lab | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Demonstrate the truth table of various expressions and combinational circuits using logic gates. | 3 | 2 | 2 | 2 | 3 | 2 | 1 | 2 | - | - | - | - | 2 | 2 | - |
| 2 | Design various combinational circuits such as adders, subtractors, comparators, multiplexers and demultiplexers. | 2 | 3 | 2 | 2 | 1 | 3 | 2 | 1 | - | - | - | - | 3 | 1 | - |
| 3 | Design and Construct counters and shift registers. | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 1 | - | - | - | - | 2 | - | 1 |
| 4 | Understand the concept of flip flops and Hazard free Circuit. | 2 | 1 | 2 | 1 | 2 | 2 | 3 | 1 | - | - | - | - | 2 | 1 | - |
| 5 | Understand the concept ROM, PLA and PAL. | 2 | 2 | 3 | 2 | 1 | 2 | 1 | 2 | - | - | - | - | - | 2 | 1 |
| Average | | 2.2 | 2 | 2.2 | 2 | 1.8 | 2.2 | 1.8 | 1.4 | - | - | - | - | 1.8 | 1.5 | 1 |

| Semester-IV | | | | | | | | | | | | | | | | |
|---|---|------------------|---|---|---|---|---|---|---|---|----|----|----|---------------------------|---|---|
| 22MA402- Probability and Stochastic Processes | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Learn the fundamental knowledge of the Probability concepts | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | 2 | - | - |
| 2 | Apply the standard distributions | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | 2 | - | - |
| 3 | Analyze the two-dimensional random variables | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | 2 | - | - |
| 4 | Understand and characterize phenomenon which evolve with respect to time in a probabilistic manner. | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | 2 | - | - |
| 5 | Acquire the knowledge of Random Processes and Spectral densities. | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | 2 | - | - |
| Average | | 3 | 2 | - | 2 | - | - | - | - | - | - | - | - | 2 | - | - |

| Semester -IV | | | | | | | | | | | | | | | | |
|--------------------------|--|------------------|---|---|---|---|---|-----|-----|---|----|----|----|---------------------------|---|---|
| 22EC401- Analog Circuits | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Analyze different types of amplifier, oscillator and multi vibrator circuits. | 2 | 3 | 3 | 2 | - | 2 | - | 2 | - | - | - | - | 1 | 2 | - |
| 2 | Construct and analyse tuned amplifier sand multi vibrators. | 2 | 3 | 3 | 2 | - | 2 | 2 | 1 | - | - | - | - | 2 | 2 | - |
| 3 | Develop competence in linear and nonlinear Op amp circuit analysis. | 2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 2 | 1 | 1 |
| 4 | Understand the concepts of waveform generation and introduce some special function ICs | 1 | - | - | 2 | - | - | 3 | - | - | - | - | - | 3 | 2 | - |
| 5 | Differentiate A/D and D/A converter, underst and their types and analyse their applications. | 2 | 3 | 3 | 2 | - | 2 | - | 2 | - | - | - | - | 2 | 3 | - |
| Average | | 1.8 | 3 | 3 | 2 | - | 2 | 2.5 | 2.5 | - | - | - | - | 2 | 2 | 1 |

| Semester -IV | | | | | | | | | | | | | | | | |
|---|--|------------------|---|---|---|---|---|---|---|---|----|----|----|---------------------------|---|---|
| 22EC402- Microprocessors and Microcontrollers | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Describe and analyse the architecture of 8-86 microprocessor and 8-51 architectures. | 2 | 2 | - | - | - | - | - | - | - | - | 2 | - | 1 | - | - |
| 2 | Develop assembly language programs and Interface peripherals with 8-86. | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | 2 | 2 | - |
| 3 | Develop assembly language programs and Interface peripherals with 8-51. | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | 2 | 2 | - |
| 4 | Determine application specific circuit for real-time applications. | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | 2 | 2 | 2 |
| 5 | Associate appropriate PIC microcontroller for a given application. | 2 | 2 | - | 2 | - | - | - | - | - | - | - | - | 2 | 2 | - |
| Average | | 2 | 2 | 2 | 2 | - | - | - | - | - | - | 2 | - | 1.8 | 2 | 2 |

| Semester -IV | | | | | | | | | | | | | | | | |
|------------------------------|--|------------------|---|---|---|---|---|---|---|---|----|----|----|---------------------------|---|-----|
| 22EC403- Signals and Systems | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Understand and Analyse different types of signals and systems. | 3 | 2 | 3 | 3 | 3 | - | - | - | - | - | - | - | 2 | 2 | 2 |
| 2 | Represent continuous and discrete systems in time and frequency domain using different transforms. | 3 | 2 | 2 | 3 | 3 | 2 | - | - | - | - | - | - | 2 | 2 | 2 |
| 3 | Able to perform Fourier analysis of signals. | 3 | 2 | 2 | 3 | 3 | 2 | - | - | - | - | - | - | 2 | 2 | 1 |
| 4 | Sample and reconstruct a signal. | 3 | 2 | 1 | 3 | 3 | 2 | - | - | - | - | - | - | 2 | 2 | 2 |
| 5 | Realize various structures for discrete time systems | 3 | 2 | 2 | 3 | 3 | - | - | - | - | - | - | - | 1 | 2 | 2 |
| Average | | 3 | 2 | 2 | 3 | 3 | 2 | - | - | - | - | - | - | 1.8 | 2 | 1.8 |

| Semester -IV | | | | | | | | | | | | | | | | |
|--------------------------|---|------------------|-----|-----|-----|---|---|---|---|---|----|----|----|---------------------------|---|-----|
| 22EC404- Control systems | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Frame the transfer function of different physical systems | 3 | 2 | 2 | 2 | 1 | - | - | - | - | - | - | - | 3 | - | 2 |
| 2 | Analyse the time domain specification and calculate the steady state error | 3 | 1 | 1 | 2 | 1 | - | - | - | - | - | - | - | 2 | - | 2 |
| 3 | Illustrate the frequency response characteristics of open loop and closed loop system response. | 3 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - | 2 | - | 1 |
| 4 | Analyse the stability of the system using Routh and root locus techniques. | 3 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - | 3 | 1 | 2 |
| 5 | Test the controllability and observability of a physical system | 2 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - | 2 | - | 1 |
| Average | | 2.8 | 1.2 | 1.2 | 1.4 | 1 | - | - | - | - | - | - | - | 2.4 | 1 | 1.6 |

| Semester -IV | | | | | | | | | | | | | | | | |
|---------------------------------------|--|------------------|---|-----|-----|---|---|---|---|---|----|----|----|---------------------------|---|---|
| 22EC405- Antenna and Wave Propagation | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Understand and derive the behaviour of the antenna and its performance parameters. | 3 | 3 | 1 | 1 | 1 | - | - | - | - | - | - | - | 1 | 1 | 1 |
| 2 | Design and analyse antenna arrays. | 3 | 2 | 2 | 2 | 1 | - | - | - | - | - | - | - | 1 | 2 | 2 |
| 3 | Design and analyse Loop, Helical and Reflector antenna. | 3 | 2 | 2 | 2 | 1 | - | - | - | - | - | - | - | 1 | 2 | 2 |
| 4 | Design and analyse aperture and lens antennas. | 3 | 2 | 2 | 2 | 1 | - | - | - | - | - | - | - | 1 | 2 | 2 |
| 5 | Study radio wave propagation and its effects. | 3 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - | - | - | - |
| Average | | 3 | 2 | 1.6 | 1.6 | 1 | - | - | - | - | - | - | - | 1 | 2 | 2 |

| Semester -IV | | | | | | | | | | | | | | | | |
|--------------------------|---|------------------|---|-----|---|---|---|---|---|---|----|----|----|---------------------------|---|---|
| 22MCIN03- Design Sprints | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Understand the elements and principles of product and service design | 3 | - | 1 | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| 2 | Apply system thinking concepts in reverse engineering | 2 | 3 | - | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| 3 | Apply user research techniques to meet the UX needs of a customer and design a visual prototype | 3 | - | 1 | - | - | - | - | 1 | 2 | - | - | - | - | - | 2 |
| 4 | Develop prototyping models using the tools from mechanical prototyping models | - | - | 3 | 2 | 3 | - | - | - | 2 | - | - | - | - | - | 2 |
| 5 | Develop prototyping models using the tools from electrical and software prototyping methods | 2 | - | 2 | - | 1 | - | - | - | 2 | - | - | - | - | - | 2 |
| Average | | 2 | 3 | 1.5 | 2 | 2 | - | - | 1 | 2 | - | - | - | - | - | 2 |

| Semester -IV | | | | | | | | | | | | | | | | |
|---------------------------------|---|------------------|---|---|---|---|---|---|---|---|----|----|----|---------------------------|---|---|
| 22CYMC01- Environmental Science | | | | | | | | | | | | | | | | |
| | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| Course Outcomes | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | To identify about the major renewable energy systems and will investigate the environmental impact of various energy sources as well as the consequences of various pollutants. | 1 | 3 | - | - | 3 | 1 | 1 | - | - | - | 1 | 2 | - | 1 | 1 |
| 2 | Predict the methods to conserve energy and ways to make optimal use of the energy for the future. | 1 | 3 | - | - | 3 | 1 | 1 | - | - | - | 1 | 2 | - | 1 | 1 |
| Average | | 1 | 3 | - | - | 3 | 1 | 1 | - | - | - | 1 | 2 | - | 1 | 1 |

| Semester -IV | | | | | | | | | | | | | | | | |
|---|--|------------------|---|---|-----|---|---|---|---|-----|----|----|----|---------------------------|---|-----|
| 22EN401- Placement and Soft Skills Laboratory | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | To participate in group discussion and interview confidently | - | - | - | 1 | - | - | - | - | 2 | 3 | - | 1 | - | - | 1 |
| 2 | To develop adequate soft skills and career skills required for the workplace | - | - | - | 2 | - | - | - | - | 2 | 3 | - | 1 | - | - | 2 |
| 3 | To make effective presentations on given topics | - | - | - | 2 | - | - | - | - | 1 | 3 | - | 1 | - | - | 1 |
| 4 | To apply their verbal ability and reasoning ability in campus interviews | - | - | - | 1 | - | - | - | - | 2 | 3 | - | 1 | - | - | 2 |
| Average | | - | - | - | 1.5 | - | - | - | - | 1.7 | 3 | - | 1 | - | - | 1.5 |

| Semester -IV | | | | | | | | | | | | | | | | |
|-------------------------------------|---|------------------|---|-----|-----|---|---|---|---|---|----|----|----|---------------------------|-----|-----|
| 22EC406- Analog Circuits Laboratory | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Design oscillators, multi vibrators and power amplifiers for the variety of engineering applications. | 2 | 3 | 3 | 3 | - | - | - | - | - | - | 1 | 1 | 1 | 2 | - |
| 2 | Design Filters Using Op amp and Perform Experiment on Frequency Response. | 2 | 3 | 3 | 3 | - | - | - | - | - | - | 1 | 1 | - | 2 | - |
| 3 | Design and simulate multi vibrators using Simulation Tool. | 2 | 2 | - | - | 3 | - | - | - | - | - | - | - | 1 | - | 2 |
| 4 | Design Oscillators and multi vibrators using operational amplifiers | 2 | 2 | - | 3 | 3 | - | - | - | - | - | - | - | - | 3 | - |
| 5 | Understand the concept of high voltage regulators | 2 | - | 2 | 2 | 3 | - | - | - | - | - | 1 | 1 | 2 | - | 1 |
| Average | | 2 | 2 | 2.7 | 2.7 | 3 | - | - | - | - | - | 1 | 1 | 1.5 | 2.3 | 1.5 |

| Semester -IV | | | | | | | | | | | | | | | | | |
|--|--|------------------|---|---|---|---|---|---|---|---|----|----|----|---------------------------|---|-----|---|
| 22EC407- Microprocessors and Microcontrollers Laboratory | | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | |
| 1 | Perform basic operations in 8-86 microprocessor and 8-51 microcontroller. | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | 2 | 2 | - |
| 2 | Interface peripherals with 8-86 microprocessor. | 2 | 3 | - | 2 | 2 | - | - | - | - | - | - | - | - | 2 | 3 | - |
| 3 | Generate waveforms using Microcontroller. | 2 | 3 | - | 2 | 2 | - | - | - | - | - | - | - | - | 2 | 2 | - |
| 4 | Develop assembly language programs for various applications using 8-51 microcontroller | 2 | 3 | - | 2 | 2 | - | - | - | - | - | - | - | - | 2 | 3 | 2 |
| 5 | Interface peripherals with 8-51 microcontroller. | 2 | 3 | - | 2 | 2 | - | - | - | - | - | - | - | - | 2 | 2 | - |
| Average | | 2 | 3 | - | 2 | 2 | - | - | - | - | - | - | - | - | 2 | 2.4 | 2 |

| Semester -V | | | | | | | | | | | | | | | | |
|--------------------------------|--|------------------|-----|-----|-----|---|---|---|---|---|----|----|----|---------------------------|-----|-----|
| 22EC501- Digital Communication | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Analyze the sampling process and the performance of a baseband and pass band digital communication system in terms of error rate | 2 | 2 | 2 | 2 | 1 | - | - | - | - | - | - | - | 2 | - | 2 |
| 2 | Able to analyse the system using eye patterns | 2 | 1 | 1 | 2 | 1 | - | - | - | - | - | - | - | 1 | - | 2 |
| 3 | Select the modulation schemes for particular applications. | 1 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - | 1 | - | 1 |
| 4 | Perform the time and frequency domain analysis of the signals in a digital communication system and design error free communication. | 2 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - | 2 | 2 | 2 |
| 5 | Understand the concept of secured communication and multiple access techniques | 2 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - | 2 | - | 1 |
| Average | | 1.8 | 1.2 | 1.2 | 1.4 | 1 | - | - | - | - | - | - | - | 1.6 | 0.4 | 1.6 |

| Semester -V | | | | | | | | | | | | | | | | |
|------------------------------------|--|------------------|---|-----|-----|---|---|---|---|---|----|----|----|---------------------------|-----|---|
| 22EC502- Digital Signal Processing | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Analyse the need for Discrete Fourier Transform, Fast Fourier Transform algorithms in digital signals & systems. | 3 | 3 | 1 | 1 | 1 | - | - | - | - | - | - | - | 1 | 1 | 1 |
| 2 | Design and realize IIR filters | 3 | 2 | 2 | 2 | 1 | - | 1 | - | - | - | - | - | 1 | 1 | 1 |
| 3 | Design and realize FIR filters | 3 | 2 | 2 | 2 | 1 | - | 1 | - | - | - | - | - | 1 | 1 | 1 |
| 4 | Analyse finite Word length effect on filters. | 3 | 2 | 2 | 2 | 1 | - | 1 | - | - | - | - | - | 1 | 1 | 1 |
| 5 | Apply the concepts of Multi rate signal processing and Gain the knowledge on DSP architecture and programming | 1 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - | 2 | 2 | 1 |
| Average | | 2.6 | 2 | 1.6 | 1.6 | 1 | - | 1 | - | - | - | - | - | 1.2 | 1.2 | 1 |

| Semester -V | | | | | | | | | | | | | | | | |
|---------------------------|---|------------------|-----|-----|-----|-----|---|---|---|---|----|----|----|---------------------------|-----|-----|
| 22EC503- Embedded Systems | | | | | | | | | | | | | | | | |
| | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| Course Outcomes | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Understand the basics of embedded systems | 2 | - | 1 | 2 | 2 | - | - | - | - | - | - | - | 1 | - | - |
| 2 | Study about the bus communication and peripheral interfacing | 2 | - | 2 | 2 | 2 | - | - | - | - | - | - | - | 2 | - | 2 |
| 3 | Know about the embedded product development and modeling | 2 | 1 | 3 | 3 | 2 | - | - | - | 2 | - | - | - | 2 | 1 | 2 |
| 4 | Acquire knowledge on Real time operating system | 2 | - | 3 | 2 | 3 | - | - | - | - | - | - | - | 1 | 1 | 1 |
| 5 | Design and Analyze the real-time applications of embedded-systems | 2 | 2 | 3 | 3 | 3 | 2 | 2 | - | 2 | - | - | - | 2 | 2 | 2 |
| Average | | 2 | 1.5 | 2.4 | 2.4 | 2.4 | 2 | 2 | - | 2 | - | - | - | 1.6 | 1.3 | 1.7 |

| Semester -V | | | | | | | | | | | | | | | | |
|-----------------------------------|--|------------------|---|-----|---|-----|---|---|---|---|----|----|----|---------------------------|-----|-----|
| 22EC504- Principles of Management | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | To have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management | 3 | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | 1 | 2 | 3 |
| 2 | To have same basic knowledge on international aspect of management. | 3 | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | 2 | 2 | 3 |
| 3 | To Gain Basic knowledge on international aspect of management. | 3 | 2 | 3 | 2 | 3 | - | - | - | - | - | - | - | 1 | 2 | 3 |
| 4 | To help the students to develop cognizance of the importance of management principles. | 3 | 1 | 2 | 1 | 3 | - | - | - | - | - | - | - | 1 | 3 | 2 |
| 5 | To enable them to analyze and understand the environment of the organization. | 3 | 1 | 2 | 1 | 2 | - | - | - | - | - | - | - | 1 | 3 | 3 |
| Average | | 3 | 2 | 2.6 | 2 | 2.8 | - | - | - | - | - | - | - | 1.2 | 2.4 | 2.8 |

| Semester -V | | | | | | | | | | | | | | | | |
|---|--|------------------|---|---|---|---|---|---|---|---|----|----|----|---------------------------|---|---|
| 22EC505- Communication Systems Laboratory | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Generate and analyse analog and digital modulated signals. | 1 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | 1 | 2 | 2 | 2 |
| 2 | Sample the given analog signal for various sampling frequency. | 1 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 2 |
| 3 | Generate various line codes for digital signals. | 1 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | 1 | 2 | 2 | 2 |
| 4 | Multiplex and de multiplex digital signals | 1 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 2 |
| 5 | Write codes for various analog and digital modulation schemes. | 2 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | 1 | 2 | 2 | 2 |
| Average | | 2.8 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | 1 | 1.6 | 2 | 2 |

| Semester -V | | | | | | | | | | | | | | | | |
|---|--|------------------|---|-----|-----|---|---|---|---|---|----|----|----|---------------------------|---|---|
| 22EC506- Digital Signal Processing Laboratory | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Generate and analyse various signal processing algorithms. | 3 | 3 | 1 | 1 | 3 | - | - | 1 | - | 1 | - | - | 1 | 1 | 1 |
| 2 | Implement FFT algorithms, Linear/Circular convolution. | 3 | 3 | 1 | 1 | 3 | - | - | 1 | - | 1 | - | - | 1 | 1 | 1 |
| 3 | Design FIR filters. | 3 | 3 | 2 | 2 | 3 | - | - | 1 | - | 1 | - | - | 1 | 1 | 1 |
| 4 | Design IIR filters. | 3 | 3 | 2 | 2 | 3 | - | - | 1 | - | 1 | - | - | 1 | 1 | 1 |
| 5 | Verify and understand system stability. | 3 | 3 | 2 | 2 | 3 | - | - | 1 | - | 1 | - | - | 1 | 1 | 1 |
| Average | | 3 | 3 | 1.6 | 1.6 | 3 | - | - | 1 | - | 1 | - | - | 1 | 1 | 1 |

| Semester -VI | | | | | | | | | | | | | | | | |
|------------------------------------|--|------------------|-----|-----|-----|-----|---|---|---|---|----|----|----|---------------------------|-----|-----|
| 22ECPE601- Electronic Measurements | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Discuss about the principles of various measurement techniques and identify its errors | 3 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 1 | - | 2 |
| 2 | Have knowledge on designing and to find the unknown elements in the measuring bridges. | 3 | - | 2 | 2 | 1 | - | - | - | - | - | - | - | 1 | 1 | 2 |
| 3 | To categorize different instruments used for signal generation and analysis. | 3 | 1 | - | 1 | 2 | - | - | - | - | - | - | - | 1 | 1 | 2 |
| 4 | Analyze the transducers and its impact and to understand the function of Data acquisition systems. | 3 | - | 1 | 2 | - | - | - | - | - | - | - | - | 1 | - | 1 |
| 5 | To have knowledge on Data display and recording Systems. | 3 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 1 | 2 | 2 |
| Average | | 3 | 1.7 | 1.7 | 1.7 | 1.7 | - | - | - | - | - | - | - | 1 | 1.3 | 1.8 |

| Semester -VI | | | | | | | | | | | | | | | | | |
|----------------------------------|--|------------------|---|-----|---|---|---|---|---|---|----|----|----|---------------------------|---|-----|---|
| 22ECPE602- Computer Architecture | | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | |
| 1 | Recognize the trends followed in designing architecture. | - | 2 | - | 2 | - | - | - | - | - | - | - | - | - | 2 | 1 | 2 |
| 2 | Illustrate the fixed point and floating-point arithmetic for ALU operation. | 2 | - | 3 | 2 | - | - | - | - | - | - | - | - | - | 1 | - | - |
| 3 | Analyse the pipeline performance considering the hazards by computing clock cycles. | 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | 2 | - | 2 |
| 4 | Differentiate the types of memory and use suitable type for architecture development | 2 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | 2 | - | 3 |
| 5 | Understand domain-specific architectures like DNN and TPU for a new application | - | 2 | 2 | - | 2 | - | - | - | - | - | - | - | - | 2 | 1 | 3 |
| Average | | 1.7 | 2 | 1.7 | 2 | 2 | - | - | - | - | - | - | - | 1.8 | 1 | 2.5 | |

| Semester -VI | | | | | | | | | | | | | | | | |
|-------------------------------------|---|------------------|-----|-----|-----|---|---|---|---|---|----|-----|----|---------------------------|---|---|
| 22ECPE603- Digital Image Processing | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Know and understand the basics and fundamentals of digital image processing, such as digitization, sampling, quantization, and 2D-transforms. | 2 | 1 | 2 | 1 | 1 | - | - | - | - | - | 1 | - | 2 | 2 | 2 |
| 2 | Operate on images using the techniques of smoothing, sharpening and enhancement. | 2 | 1 | 2 | 1 | 1 | - | - | - | - | - | 1 | - | 2 | 2 | 2 |
| 3 | Understand the restoration concepts and filtering techniques. | 2 | 2 | 3 | 2 | 1 | - | - | - | - | - | 2 | - | 2 | 2 | 2 |
| 4 | Learn the basics of segmentation and features extraction | 2 | 2 | 2 | 1 | 1 | - | - | - | - | - | 1 | - | 2 | 2 | 2 |
| 5 | Apply compression and recognition methods for color models. | 2 | 2 | 3 | 2 | 1 | - | - | - | - | - | 2 | - | 2 | 2 | 2 |
| Average | | 2 | 1.6 | 2.4 | 1.4 | 1 | - | - | - | - | - | 1.4 | - | 2 | 2 | 2 |

| Semester -VI | | | | | | | | | | | | | | | | |
|-----------------------------|--|------------------|-----|-----|-----|---|---|---|---|---|----|-----|-----|---------------------------|---|---|
| 22ECPE604- Machine Learning | | | | | | | | | | | | | | | | |
| | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| Course Outcomes | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Understand the mathematical foundation for solving ML problems. | 2 | 1 | 2 | 1 | 1 | - | - | - | - | - | 1 | 1 | 2 | 2 | 2 |
| 2 | Apply various supervised learning technique to solve ML problem | 2 | 1 | 2 | 1 | 1 | - | - | - | - | - | 1 | 1 | 2 | 2 | 2 |
| 3 | Apply various unsupervised and reinforcement learning technique to solve ML problems | 2 | 2 | 3 | 2 | 1 | - | - | - | - | - | 3 | 2 | 2 | 2 | 2 |
| 4 | Understand various probabilistic methods of learning. | 2 | 2 | 2 | 1 | 1 | - | - | - | - | - | 3 | 2 | 2 | 2 | 2 |
| 5 | Understand basic idea behind neural network and deep learning. | 2 | 2 | 3 | 2 | 1 | - | - | - | - | - | 3 | 2 | 2 | 2 | 2 |
| Average | | 2 | 1.6 | 2.4 | 1.4 | 1 | - | - | - | - | - | 2.2 | 1.6 | 2 | 2 | 2 |

| Semester -VI | | | | | | | | | | | | | | | | |
|--|---|------------------|---|-----|-----|-----|---|-----|---|---|----|----|-----|---------------------------|---|---|
| 22ECPE605- Modern Sensors and Its Applications | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Appreciate the operation of various measuring and control instruments which they encounter in their respective fields. | 1 | 2 | - | - | - | - | - | - | - | - | - | - | 2 | - | - |
| 2 | Visualize the sensors and the measuring systems when they have to work in areas of interdisciplinary nature and also think of sensors and sensors systems when for a new situation they encounter in their career | 2 | 2 | 1 | 1 | - | 2 | 1 | - | - | - | 3 | 1 | 3 | 2 | - |
| 3 | Identify and select the right process or phenomena on which the sensor should depend on. | 2 | 2 | 2 | 1 | - | - | 3 | - | - | - | 2 | - | 2 | - | - |
| 4 | Know various stimuli that are to be measured in real life instrumentation. | 3 | 2 | 3 | 2 | 3 | - | - | - | - | - | 1 | - | 1 | 2 | - |
| 5 | Apply all types sensor in various fields. | 3 | 2 | 3 | - | 2 | 2 | 1 | - | - | - | 2 | 2 | 2 | - | 1 |
| Average | | 2.2 | 2 | 2.2 | 1.3 | 2.5 | 2 | 1.3 | - | - | - | 2 | 1.5 | 2 | 2 | 1 |

| Semester -VI | | | | | | | | | | | | | | | | |
|--------------------------------|--|------------------|---|-----|-----|---|---|---|---|---|----|----|----|---------------------------|---|---|
| 22ECPE606- Radar Communication | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Identify the concepts of radar measurements, radar functions and range equation. | - | 2 | 3 | 3 | 2 | - | - | - | - | - | 2 | - | 2 | 2 | 2 |
| 2 | Famil Familiarize about MTI and pulse Doppler radar and detection of RADAR signals. | - | 2 | 3 | 3 | 2 | - | - | - | - | - | 2 | - | 2 | 2 | 2 |
| 3 | Analyze the principle behind, detecting the signals of radar communication. | - | 2 | 2 | 3 | 2 | - | - | - | - | - | 2 | - | 2 | 2 | 2 |
| 4 | Apply CFAR detector to improve the detection performance of Radar. | - | 2 | 3 | 2 | 2 | - | - | - | - | - | 2 | - | 2 | 2 | 2 |
| 5 | Gain Knowledge in RADAR systems and analyze the signal to noise ratio in the radar system. | - | 2 | 3 | 3 | 2 | - | - | - | - | - | 2 | - | 2 | 2 | 2 |
| Average | | - | 2 | 2.8 | 2.8 | 2 | - | - | - | - | - | 2 | - | 2 | 2 | 2 |

| Semester -VI | | | | | | | | | | | | | | | | |
|-------------------------------|---|------------------|-----|---|---|---|---|---|---|---|----|----|-----|---------------------------|---|---|
| 22ECPE607- Internet of Things | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Understand the vision of IOT from a global context. | - | 1 | - | - | 2 | - | - | - | - | - | - | - | - | - | - |
| 2 | Determine the Market perspective of IOT. | 2 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | 1 | 1 | - | - |
| 3 | Understand the IOT technology fundamentals. | 2 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | 1 | 1 | - | - |
| 4 | Build small system using Raspberry Pi. | 2 | 2 | 2 | 2 | 2 | - | - | - | - | - | 2 | 2 | 2 | - | - |
| 5 | Analyse applications of IOT and case studies | 2 | 2 | 2 | 2 | 2 | - | - | - | - | - | 2 | - | 2 | - | 2 |
| Average | | 2 | 1.8 | 2 | 2 | 2 | - | - | - | - | - | 2 | 1.3 | 1.5 | - | 2 |

| Semester -VI | | | | | | | | | | | | | | | | |
|------------------------------|--|------------------|-----|-----|---|-----|---|---|---|---|----|----|----|---------------------------|---|-----|
| 22ECPE608- Computer Networks | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Explain the basic concept in modern data communication and different level of layers in the protocol | 2 | 1 | 1 | - | 1 | - | - | - | - | - | - | - | 2 | - | 1 |
| 2 | Analyse the functions and services of data link layer | 2 | 1 | 2 | - | 1 | - | - | - | - | - | - | - | 2 | 1 | 1 |
| 3 | Categorize the functions and services of network layer | 2 | 1 | 1 | - | - | - | - | - | - | - | - | - | 3 | 1 | 2 |
| 4 | Examine the basic functions of transport layer and congestion in networks | 3 | 2 | 1 | - | 2 | - | - | - | - | - | - | - | 2 | - | 2 |
| 5 | Analyse the concepts of various network applications and data security | 2 | 1 | 1 | - | 1 | - | - | - | - | - | - | - | 1 | 1 | 1 |
| Average | | 2.2 | 1.2 | 1.2 | - | 1.5 | - | - | - | - | - | - | - | 2 | 1 | 1.4 |

| Semester -VI | | | | | | | | | | | | | | | | |
|-----------------------------------|--|------------------|---|---|-----|---|-----|---|-----|---|----|----|----|---------------------------|-----|---|
| 22ECPE609- Software Defined Radio | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Gain knowledge on the design principles on software defined radio and cognitive radio | 1 | - | 1 | 2 | - | - | - | 1 | - | - | - | - | 1 | - | - |
| 2 | An ability to make system-level decisions for software-defined radio technology and products | - | 1 | - | - | - | 2 | - | - | - | - | - | - | - | 2 | - |
| 3 | Gain knowledge and understanding of software defined radio architecture. | 2 | - | - | 1 | - | - | - | - | - | - | - | - | 1 | - | - |
| 4 | Apply the knowledge of advanced features of cognitive radio for real world applications | - | - | - | - | - | - | 2 | - | - | - | - | - | 2 | 1 | 1 |
| 5 | Knowledge and development methods for wireless Network | 2 | - | 1 | - | - | 1 | - | 2 | - | - | - | - | 1 | - | - |
| Average | | 1.7 | 1 | 1 | 1.5 | - | 1.5 | 2 | 1.5 | - | - | - | - | 1.2 | 1.5 | 1 |

| Semester -VI | | | | | | | | | | | | | | | | |
|--------------------------------|--|------------------|---|---|-----|-----|-----|---|---|---|----|----|----|---------------------------|-----|-----|
| 22ECPE610- High Speed Networks | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Compare ATM, Frame Relay and TCP/IP networks. | 2 | - | 1 | 1 | 2 | 1 | - | - | - | - | 2 | - | 1 | 2 | 2 |
| 2 | Understand the concepts of queuing mechanism and congestion control techniques in packet switching and frame relay networks. | 3 | - | 1 | 2 | 2 | 2 | - | - | - | - | - | - | 1 | 1 | 1 |
| 3 | Analyze the traffic management in TCP and ATM. | 2 | - | 1 | 2 | 1 | 2 | - | - | - | - | - | - | 2 | 2 | 2 |
| 4 | Be familiar with the integrated and differentiated service architecture. | 1 | - | 1 | 1 | 1 | 1 | - | - | - | - | - | - | 1 | 2 | 1 |
| 5 | Understand the protocols to support various levels of quality of service to different applications. | 1 | - | 1 | 1 | 2 | 1 | - | - | - | - | 2 | - | 2 | 2 | 2 |
| Average | | 1.8 | - | 1 | 1.4 | 1.6 | 1.4 | - | - | - | - | 2 | - | 1.4 | 1.8 | 1.6 |

| Semester VI | | | | | | | | | | | | | | | | |
|---------------------|--|------------------|-----|-----|-----|---|---|-----|-----|---|----|----|-----|---------------------------|-----|-----|
| 22ECPE611- Robotics | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | The students can able to apply the basic engineering knowledge for the design of robotics. | 1 | 2 | 1 | 1 | 1 | - | - | - | - | - | - | - | 1 | - | - |
| 2 | Apply the knowledge on robot drive systems and end effectors. | 2 | 1 | 2 | 2 | 1 | - | 1 | - | - | - | - | 1 | 2 | 1 | - |
| 3 | Have the knowledge on Sensors and meters | 2 | 2 | 1 | 2 | 2 | - | 1 | - | - | - | - | 1 | 2 | 2 | 2 |
| 4 | Able to apply the Robotic kinematic and VAL Programming | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 1 | - | - | - | 2 | 2 | 2 | - |
| 5 | Implement the robotics on economics and safety. | 3 | 3 | 2 | 3 | 3 | 1 | 2 | 2 | 1 | 1 | 3 | 3 | 3 | 2 | 3 |
| Average | | 2 | 2.2 | 1.6 | 2.2 | 2 | 1 | 1.5 | 1.5 | 1 | 1 | 3 | 1.7 | 2 | 1.7 | 2.5 |

| Semester -VI | | | | | | | | | | | | | | | | |
|------------------------------------|--|------------------|---|---|---|-----|---|---|---|---|----|----|----|---------------------------|-----|---|
| 22ECPE612- Virtual Instrumentation | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Apply structured programming concepts in developing VI programs and employ various debugging techniques. | 3 | 3 | 2 | 3 | 3 | - | - | - | - | - | - | - | 1 | 2 | 1 |
| 2 | Create applications that uses plug in DAQ boards and built in analysis functions to process the data. | 3 | 2 | 2 | 3 | 2 | - | - | - | - | - | - | - | 2 | 2 | 2 |
| 3 | Define and Describe acquisition methodologies. | 3 | 2 | 2 | 2 | 3 | - | - | - | - | - | - | - | 1 | 2 | 2 |
| 4 | Design and analyze various applications using signal Processing tool kit | 3 | 1 | 2 | 1 | 2 | - | - | - | - | - | - | - | 1 | 3 | 2 |
| 5 | Design and analyze various applications using control and simulation tool kit. | 3 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | - | 1 | 3 | 3 |
| Average | | 3 | 2 | 2 | 2 | 2.4 | - | - | - | - | - | - | - | 1.2 | 2.4 | 2 |

| Semester -VI | | | | | | | | | | | | | | | | |
|-----------------------------------|--|------------------|---|---|---|---|---|---|---|---|----|-----|----|---------------------------|---|---|
| 22ECPE613- Automotive Electronics | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Know the importance of emission standards in automobiles | 3 | 3 | 1 | 3 | 3 | 3 | 2 | - | - | - | 3 | 3 | 3 | - | 2 |
| 2 | Understand the electronic fuel injection/ignition components and their function | 3 | 3 | 2 | 3 | 3 | 3 | 2 | - | - | - | 3 | 3 | 3 | - | 2 |
| 3 | Choose and use sensors and equipment for measuring mechanical quantities, temperature and appropriate actuators. | 3 | 3 | 3 | 3 | 3 | 3 | 2 | - | - | - | 3 | 3 | 3 | - | 2 |
| 4 | Diagnose electronic engine control systems problems with appropriate diagnostic tools. | 3 | 3 | 2 | 3 | 3 | 3 | 2 | - | - | - | 2 | 3 | 3 | - | 2 |
| 5 | Understand the safety measures in chassis and vehicle. | 3 | 3 | 2 | 3 | 3 | 3 | 2 | - | - | - | 3 | 3 | 3 | - | 2 |
| Average | | 3 | 3 | 2 | 3 | 3 | 3 | 2 | - | - | - | 2.8 | 3 | 3 | - | 2 |

| Semester -VI | | | | | | | | | | | | | | | | |
|-----------------------|--|------------------|-----|---|---|---|---|---|---|---|----|----|-----|---------------------------|---|---|
| 22ECPE614- Embedded C | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Understand basics of embedded systems and 8-51 microcontroller | - | 1 | - | - | 2 | - | - | - | - | - | - | - | - | - | - |
| 2 | Develop basic embedded programs | 2 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | 1 | 1 | - | - |
| 3 | Develop advanced embedded programs | 2 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | 1 | 1 | - | - |
| 4 | Relate and write programs for embedded Operating System | 2 | 2 | 2 | 2 | 2 | - | - | - | - | - | 2 | 2 | 2 | - | - |
| 5 | Analyse the case study problems | 2 | 2 | 2 | 2 | 2 | - | - | - | - | - | 2 | - | 2 | - | 2 |
| Average | | 2 | 1.8 | 2 | 2 | 2 | - | - | - | - | - | 2 | 1.3 | 1.5 | - | 2 |

| Semester -VI | | | | | | | | | | | | | | | | | |
|---------------------------------|---|------------------|-----|---|---|---|---|---|---|---|----|----|----|---------------------------|---|-----|---|
| 22ECPE615- VLSI Physical Design | | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | |
| 1 | Know to place the blocks and to partition the blocks while designing the layout for IC. | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - | - | - | 1 | 1 | - |
| 2 | Solve the performance issues in circuit layout. | 2 | 2 | 1 | 1 | - | - | - | - | - | - | - | - | - | 1 | - | - |
| 3 | Analyze physical design problems and Employ appropriate automation algorithms for partitioning, floor planning, placement and routing | 2 | 2 | 1 | 1 | - | - | - | - | - | - | - | - | - | 1 | - | - |
| 4 | Decompose large mapping problem into pieces, including logic optimization with partitioning, placement and routing | 1 | 1 | 1 | 1 | - | 1 | - | - | - | - | - | - | - | 1 | 1 | - |
| 5 | Students are able to analyze circuits using both analytical and CAD tools. | 3 | 3 | 1 | 1 | 3 | 1 | - | - | - | - | - | - | - | 1 | 2 | 3 |
| Average | | 1.8 | 1.8 | 1 | 1 | 3 | 1 | - | - | - | - | - | - | - | 1 | 1.5 | 3 |

| Semester -VI | | | | | | | | | | | | | | | | |
|-------------------------------|---|------------------|---|-----|-----|-----|---|---|---|---|----|----|----|---------------------------|---|-----|
| 22ECPE616- RF&EMI/EMC Testing | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Explain the basics of RF measurement and Experience testing of RF components. | - | 2 | 3 | 3 | 3 | - | - | - | - | - | 2 | - | 3 | 2 | 3 |
| 2 | Find the source of Electromagnetic interference. | - | 2 | 3 | 3 | 2 | - | - | - | - | - | 2 | - | 3 | 2 | 3 |
| 3 | Predict the proper grounding, Shield and safety equipment's. | - | 2 | 3 | 2 | 3 | - | - | - | - | - | 2 | - | 2 | 2 | 2 |
| 4 | Analyze the test conditions for the EUT. | - | 2 | 2 | 3 | 3 | - | - | - | - | - | 2 | - | 2 | 2 | 2 |
| 5 | Explain the measurements with help of testing procedures and explain the standards for EMI/EMC. | - | 2 | 3 | 3 | 3 | - | - | - | - | - | 2 | - | 3 | 2 | 3 |
| Average | | - | 2 | 2.8 | 2.8 | 2.8 | - | - | - | - | - | 2 | - | 2.6 | 2 | 2.6 |

| Semester -VII | | | | | | | | | | | | | | | | |
|-----------------------|---|------------------|---|---|---|---|---|---|---|---|----|----|----|---------------------------|---|---|
| 22EC7010- VLSI Design | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Understand the concept of MOS transistors, use analytical methods and circuit analysis models in analysis of CMOS circuits. | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 |
| 2 | Understand the CMOS process technology and design layout diagrams. | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 |
| 3 | Able to learn and design data path systems and array of subsystems. | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 |
| 4 | Model the digital system using Verilog Hardware Description Language and | 2 | 1 | - | 2 | 3 | - | - | - | - | - | - | - | 1 | 2 | 1 |
| 5 | Learn FPGA architectures and need for CMOS testing. | - | - | 2 | 2 | - | - | - | - | - | - | - | - | - | 2 | 1 |
| Average | | 1.7 | 1 | 1 | 1 | 3 | - | - | - | - | - | - | - | 1 | 2 | 1 |

| Semester -VII | | | | | | | | | | | | | | | | |
|---|--|-------------------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|----------------------------------|----------|----------|
| 22EC702- Optical and Microwave Engineering | | | | | | | | | | | | | | | | |
| | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| Course Outcomes | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Explain the active and passive microwave components used in microwave communication. | - | 2 | 2 | 2 | - | - | - | - | - | - | 1 | - | 1 | 2 | 1 |
| 2 | Have an in-depth knowledge of microwave generation and amplification. | - | 3 | 2 | 3 | - | - | - | - | - | - | 2 | - | 1 | 2 | 1 |
| 3 | Calculate the degradation in the signal due to losses and dispersion. | - | 2 | 2 | 2 | - | - | - | - | - | - | - | - | 2 | 1 | 2 |
| 4 | Ability to identify, understand and evaluate fiber transmission characteristics for real time link design. | - | 2 | 2 | 2 | - | - | - | - | - | - | 2 | - | 2 | 1 | 2 |
| 5 | Explain the various optical sources and optical detectors and their use in the optical communication system. | - | 1 | 2 | 2 | - | - | - | - | - | - | 1 | - | 1 | 2 | 1 |
| Average | | - | 2 | 2 | 2.2 | - | - | - | - | - | - | 1.5 | - | 1.4 | 1.6 | 1.4 |

| Semester -VII | | | | | | | | | | | | | | | | |
|--|--|------------------|---|-----|-----|---|---|---|---|---|----|----|----|---------------------------|---|-----|
| 22EC703- Wireless and Mobile Communication | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Characterize a wireless channel and evolve the system design specifications and understand the difference between wireless compared to wired counterpart. | - | 1 | 1 | 2 | 1 | - | - | - | - | - | - | - | 1 | 2 | 1 |
| 2 | Design a cellular system, with improved coverage and capacity with the cell structure based on the resource availability and traffic demands and able to calculate interference. | 2 | 1 | 2 | 2 | 1 | - | - | - | - | - | - | - | 1 | 2 | 2 |
| 3 | Identify various propagation effects and calculate large scale path loss. | 1 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - | 1 | 2 | 1 |
| 4 | Analyze small scale and multipath fading in mobile environment. | 1 | 1 | 2 | 1 | 1 | - | - | - | - | - | - | - | 1 | 2 | 1 |
| 5 | Exploit multiple antenna techniques for capacity / performance gains and design equalizer. | 1 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - | 1 | 2 | 1 |
| Average | | 1.7 | 1 | 1.4 | 1.4 | 1 | - | - | - | - | - | - | - | 1 | 2 | 1.2 |

| Semester -VII | | | | | | | | | | | | | | | | |
|---|--|------------------|---|---|---|---|---|---|---|---|----|----|----|---------------------------|---|---|
| 22EC704- Optical and Microwave Engineering Laboratory | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Analyze the performance of simple optical link. | 1 | 3 | 3 | 3 | - | - | 2 | - | - | - | 2 | - | 3 | 2 | 2 |
| 2 | Gain knowledge on working of LED and photo detector. | 2 | 3 | 3 | 3 | - | - | 2 | - | - | - | 2 | - | 3 | 2 | 2 |
| 3 | Gain knowledge on testing microwave components. | 2 | 3 | 3 | 3 | - | - | 2 | - | - | - | 2 | - | 3 | 2 | 2 |
| 4 | Analyze the radiation of pattern of antenna, | 1 | 3 | 3 | 3 | - | - | 2 | - | - | - | 2 | - | 3 | 2 | 2 |
| 5 | Measure a microwave link's impedance, VSWR, and frequency. | 1 | 3 | 3 | 3 | - | - | 2 | - | - | - | 2 | - | 2 | 2 | 2 |
| Average | | 1.4 | 3 | 3 | 3 | - | - | 2 | - | - | - | 2 | - | 2.8 | 2 | 2 |

| Semester -VII | | | | | | | | | | | | | | | | |
|--|--|------------------|---|---|---|---|---|---|---|---|----|----|----|---------------------------|---|---|
| 22EC705- VLSI Design and Embedded Systems Laboratory | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | To demonstrate a clear understanding in VeriLog HDL | 1 | 2 | 1 | - | 3 | 1 | - | - | - | 1 | - | - | 2 | 3 | 1 |
| 2 | Model a combinational circuit and sequential circuit using Verilog HDL. | 1 | 2 | 1 | - | 3 | 1 | - | - | - | 1 | - | - | 2 | 3 | 1 |
| 3 | Import the logic modules into FPGA boards. | 1 | 2 | 1 | - | 3 | 1 | - | - | - | 1 | - | - | 2 | 3 | 1 |
| 4 | Write, debug and compile embedded processors programs for a given Application. | 1 | 2 | 1 | - | 3 | 1 | - | - | - | 1 | - | - | 2 | 3 | 1 |
| 5 | Implement interrupt control for a given embedded System. | 1 | 2 | 1 | - | 3 | 1 | - | - | - | 1 | - | - | 2 | 3 | 1 |
| Average | | 1 | 2 | 1 | - | 3 | 1 | - | - | - | 1 | - | - | 2 | 3 | 1 |

| Semester -VIII | | | | | | | | | | | | | | | | |
|---|---|------------------|-----|-----|-----|-----|---|---|---|---|----|----|----|---------------------------|-----|-----|
| 22ECPE801-Multimedia Compression and Communication Techniques | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | To understand different coding techniques and apply various algorithms for compression. | 2 | 1 | 1 | 3 | 2 | - | - | - | - | - | - | - | 3 | 1 | 2 |
| 2 | To understand the quality and performance of various text and audio compression algorithms. | 3 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | 3 | 1 | 2 |
| 3 | Apply various text and video compression algorithms for practical applications. | 3 | 2 | 1 | 2 | 2 | - | - | - | - | - | - | - | 3 | 2 | 1 |
| 4 | Apply the compression concepts in multimedia communication. | 2 | 2 | 2 | 3 | 1 | - | - | - | - | - | - | - | 3 | 1 | 1 |
| 5 | Able to configure multimedia communication network. | 2 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | 3 | 2 | 2 |
| Average | | 2.4 | 1.8 | 1.2 | 2.8 | 1.4 | - | - | - | - | - | - | - | 3 | 1.4 | 1.6 |

| Semester -VIII | | | | | | | | | | | | | | | | |
|--|---|-------------------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|----------------------------------|----------|----------|
| 22ECPE802- Wireless Sensor Networks | | | | | | | | | | | | | | | | |
| | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| Course Outcomes | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Know the basics of Ad hoc networks and Wireless Sensor Networks | 3 | 3 | 1 | 3 | 3 | 3 | 2 | - | - | - | 3 | 3 | 3 | - | 2 |
| 2 | Have a knowledge on architecture of Wireless Sensor Networks | 3 | 3 | 2 | 3 | 3 | 3 | 2 | - | - | - | 3 | 3 | 3 | - | 2 |
| 3 | Apply the knowledge to identify MAC and routing protocols | 3 | 3 | 3 | 3 | 3 | 3 | 2 | - | - | - | 3 | 3 | 3 | - | 2 |
| 4 | Understand the transport layer and security issues possible in Ad hoc and sensor networks | 3 | 3 | 2 | 3 | 3 | 3 | 2 | - | - | - | 2 | 3 | 3 | - | 2 |
| 5 | Be familiar with the OS used in Wireless Sensor Networks and build basic modules | 3 | 3 | 2 | 3 | 3 | 3 | 2 | - | - | - | 3 | 3 | 3 | - | 2 |
| Average | | 3 | 3 | 2 | 3 | 3 | 3 | 2 | - | - | - | 2.8 | 3 | 3 | - | 2 |

| Semester -VIII | | | | | | | | | | | | | | | | | |
|---|--|------------------|---|---|---|---|---|---|---|---|----|----|----|---------------------------|---|---|---|
| 22ECPE803- Telecommunication and Switching Networks | | | | | | | | | | | | | | | | | |
| Course Outcomes | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | |
| 1 | Understand the concepts of Frequency and Time division multiplexing | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | 1 |
| 2 | Design the Space division switching and Time division switching | 2 | 1 | - | - | - | - | - | - | - | - | - | - | - | 2 | 2 | 1 |
| 3 | Understand the concepts of network organization of telephone networks | 2 | - | 1 | - | - | 1 | - | - | - | - | - | - | 2 | 2 | 1 | |
| 4 | To compare telephone network, data network and integrated service digital network. | 2 | - | 1 | - | - | - | - | - | - | - | - | - | - | 2 | 1 | |
| 5 | Analyse traffic in telephone networks | 2 | 1 | - | 1 | - | - | - | - | - | - | - | - | 2 | 2 | 1 | |
| Average | | 2 | 1 | 1 | 1 | - | 1 | - | - | - | - | - | - | 2 | 2 | 1 | |

| Semester -VIII | | | | | | | | | | | | | | | | |
|--------------------------|--|------------------|-----|-----|-----|---|---|---|---|---|----|-----|-----|---------------------------|---|---|
| 22ECPE804- Deep Learning | | | | | | | | | | | | | | | | |
| | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| Course Outcomes | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Understand basic idea behind deep learning. | 2 | 1 | 2 | 1 | 1 | - | - | - | - | - | 1 | 1 | 2 | 2 | 2 |
| 2 | Develop concept of feed forward network and encoders | 2 | 1 | 2 | 1 | 1 | - | - | - | - | - | 1 | 1 | 2 | 2 | 2 |
| 3 | Apply concept of CNN in a real time application. | 2 | 2 | 3 | 2 | 1 | - | - | - | - | - | 3 | 2 | 2 | 2 | 2 |
| 4 | Apply concept of RNN for an application | 2 | 2 | 2 | 1 | 1 | - | - | - | - | - | 3 | 2 | 2 | 2 | 2 |
| 5 | Develop Deep Generative models | 2 | 2 | 3 | 2 | 1 | - | - | - | - | - | 3 | 2 | 2 | 2 | 2 |
| Average | | 2 | 1.6 | 2.4 | 1.4 | 1 | - | - | - | - | - | 2.2 | 1.6 | 2 | 2 | 2 |

Semester -VIII

2ECPE805- Network Security

| | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
|-----------------|--|------------------|-----|-----|-----|---|---|---|---|---|----|-----|-----|---------------------------|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| Course Outcomes | | | | | | | | | | | | | | | | |
| 1 | Understand the fundamentals of networks security, security architecture, threats and vulnerabilities | 2 | 1 | 2 | 1 | 1 | - | - | - | - | - | 1 | 1 | 2 | 2 | 2 |
| 2 | Apply the different cryptographic operations of symmetric cryptographic algorithms | 2 | 1 | 2 | 1 | 1 | - | - | - | - | - | 1 | 1 | 2 | 2 | 2 |
| 3 | Apply the different cryptographic operations of public key cryptography | 2 | 2 | 3 | 2 | 1 | - | - | - | - | - | 3 | 2 | 2 | 2 | 2 |
| 4 | Apply the various Authentication schemes to simulate different applications. | 2 | 2 | 2 | 1 | 1 | - | - | - | - | - | 3 | 2 | 2 | 2 | 2 |
| 5 | Understand various Security practices and System security standards | 2 | 2 | 3 | 2 | 1 | - | - | - | - | - | 3 | 2 | 2 | 2 | 2 |
| Average | | 2 | 1.6 | 2.4 | 1.4 | 1 | - | - | - | - | - | 2.2 | 1.6 | 2 | 2 | 2 |

Semester -VIII

22ECPE806- Satellite Communication

| | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
|-----------------|---|------------------|-----|-----|-----|---|---|---|---|---|----|----|----|---------------------------|-----|-----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| Course Outcomes | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Describe the motion of satellite in the orbit and understand orbital effects in communications system performance | - | 2 | 2 | 2 | 1 | - | - | - | - | - | - | - | 1 | 2 | 1 |
| 2 | Calculate the received carrier power at the input of earth station receiver or satellite transponder. | 2 | 1 | 1 | 2 | 1 | - | - | - | - | - | - | - | 1 | 2 | 2 |
| 3 | Compute the noise power and carrier to noise ratio at the input of earth station or satellite transponder | 2 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - | 1 | 2 | 1 |
| 4 | Calculate losses and design both up-link and down link | 2 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - | 2 | 2 | 1 |
| 5 | design domestic satellite system using small earth station | 1 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - | 2 | 1 | 1 |
| Average | | 1.7 | 1.2 | 1.2 | 1.4 | 1 | - | - | - | - | - | - | - | 1.4 | 1.8 | 1.2 |

Semester -VIII

22ECPE807- Bio Medical Electronics

| | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
|-----------------|---|------------------|-----|-----|-----|-----|---|---|---|---|----|----|----|---------------------------|-----|-----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| Course Outcomes | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Acquire and analyze the various bio signals and vital parameters. | 3 | 2 | 2 | 2 | 1 | - | - | - | - | - | - | - | 3 | - | 2 |
| 2 | Measure biochemical and other physiological information. | 3 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | - | 3 | 1 | 2 |
| 3 | To understand the use of radiation for diagnostic and therapy | 3 | 1 | 3 | 1 | 1 | - | - | - | - | - | - | - | 3 | 1 | 2 |
| 4 | Explain the function and application of various diagnostic and therapeutic equipment. | 3 | 2 | 2 | 1 | - | - | - | - | - | - | - | - | 3 | 2 | 1 |
| 5 | Explain about the recent developments in the field of biomedical engineering and analyze the safety aspects of medical equipment. | 3 | 2 | 3 | 1 | 1 | - | - | - | - | - | - | - | 3 | 2 | 2 |
| Average | | 3 | 1.8 | 2.4 | 1.2 | 1.2 | - | - | - | - | - | - | - | 3 | 1.5 | 1.8 |

| Semester -VIII | | | | | | | | | | | | | | | | |
|-----------------------------------|--|-------------------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|----------------------------------|----------|----------|
| 22ECPE808- Cognitive Radio | | | | | | | | | | | | | | | | |
| | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| Course Outcomes | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Understand the concepts and design of cognitive radios. | - | 2 | 2 | 2 | 1 | - | 2 | - | 1 | - | 1 | 1 | 2 | - | 1 |
| 2 | Study about the SDR architecture and analysis. | - | 2 | 2 | 1 | 2 | - | 1 | - | 1 | - | 1 | 1 | 2 | 1 | 1 |
| 3 | Analyse the various cognitive radio network architectures. | - | 1 | 3 | 1 | 1 | - | 1 | - | 1 | - | 1 | 1 | 2 | 1 | 1 |
| 4 | Analyse the various security threats to the radio software in cognitive radio network. | - | 2 | 2 | 1 | - | - | 2 | - | 1 | - | 1 | 1 | 2 | 2 | 1 |
| 5 | To analyse the performance of MAC and network layer design for cognitive radio. | - | 2 | 3 | 1 | 1 | - | 1 | - | 1 | - | 1 | 1 | 2 | 2 | 1 |
| Average | | - | 1.8 | 2.4 | 1.2 | 1.2 | - | 1.4 | - | 1 | - | 1 | 1 | 2 | 1.5 | 1 |

| Semester - VIII | | | | | | | | | | | | | | | | |
|-----------------------|---|------------------|---|---|---|---|---|---|---|---|----|-----|----|---------------------------|---|---|
| 18EC801- Project work | | | | | | | | | | | | | | | | |
| | | Program Outcomes | | | | | | | | | | | | Program Specific Outcomes | | |
| Course Outcomes | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | Discover potential research areas in the field of ECE | 2 | 3 | 3 | 3 | 3 | 2 | 2 | - | - | - | 1 | - | 1 | 2 | 3 |
| 2 | Conduct a survey of several available literature in the preferred field of study | - | 3 | 3 | 3 | 3 | 2 | 2 | - | - | - | 1 | - | 1 | 2 | 3 |
| 3 | Compare and contrast the several existing solutions for research | - | 3 | 3 | 3 | | 2 | 2 | - | - | - | 1 | - | 1 | 2 | 3 |
| 4 | Demonstrate an ability to work in teams and manage the conduct of the research study. | - | - | - | - | - | - | - | - | 3 | - | 2 | 3 | 1 | 2 | 3 |
| 5 | Formulate and propose a plan for creating a solution for the research plan identified | - | 3 | 3 | 3 | - | 2 | 2 | 3 | - | - | 1 | - | 1 | - | 3 |
| 6 | To report and present the findings of the study conducted in the preferred domain | - | 3 | - | - | - | - | - | - | 3 | 3 | 1 | - | 1 | - | - |
| Average | | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 1.6 | 3 | 1 | 3 | 3 |