

**REGENT EDUCATION AND RESEARCH FOUNDATION GROUP OF INSTITUTIONS**

**Department of Electrical and Electronics Engineering (2021-2022)**

| Program Code | Program Name                                    | Course Code | Course Name       | Course outcome |   |
|--------------|---|-------------|-------------------|----------------|---|
|              |   |             |                   | CO Sl. No.     | CO's  |
| EEE-UG       | Electrical and Electronics Engineering (B.Tech) | BS CH 101   | Chemistry-I(Gr-B) | BSCH101.1      | Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces.  |
|              |   |             |                   | BSCH101.2      | Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques                    |
|              |   |             |                   | BSCH101.3      | Rationalise bulk properties and processes using thermodynamic considerations.   |
|              |   |             |                   | BSCH101.4      | Rationalise different periodic properties such as ionization potential, electronegativity, oxidation states, electronegativity etc among the elements.            |
|              |   |             |                   | BSCH101.5      | To find out the Structural representation of Molecules in three dimensions and major chemical reactions involved to synthesize molecules as well as common drugs. |
| EEE-UG       | Electrical and Electronics Engineering (B.Tech) | BS M 102    | Mathematics –IB   | BS M 102.1     | Apply the concept and techniques of differential and integral calculus to determine curvature and evaluation of different types of improper integrals.            |

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|        |   |             |                               | <b>BS M 102.2</b>    | Understand the domain of applications of mean value theorems to engineering problems   |
|        |   |             |                               | <b>BS M 102.3</b>    | Learn the tools of power series and Fourier series to analyse engineering problems and apply the concept of convergence of infinite series in many approximation techniques in engineering disciplines |
|        |   |             |                               | <b>BS M 102.4</b>    | Apply the knowledge for addressing the real life problems which comprises of several variables or attributes and identify extremum points of different surfaces of higher dimensions                   |
|        |   |             |                               | <b>BS M 102.5</b>    | Apply the method of Gauss Jordan elimination to find the solution of systems of simultaneous linear equations.   |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | ES - EE 101 | Basic Electrical Engineering  | <b>ES - EE 101.1</b> | To introduce the components of low voltage electrical installations  |
|        |   |             |                               | <b>ES - EE 101.2</b> | To understand and analyze basic electric and magnetic circuits.  |
|        |   |             |                               | <b>ES - EE 101.3</b> | To study the working principles of electrical machines and power converters  |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | BS - CH 191 | Chemistry-I Laboratory (Gr-B) | <b>BS - CH 191.1</b> | To understand the basic concepts of chemistry and use them for technological operation where appropriate.  |
|        |   |             |                               | <b>BS - CH 191.2</b> | To exercise basic laboratory data analysis techniques, including graphical representation, error analysis etc.   |

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|        |   |             |   | <b>BS - CH 191.3</b> | To correlate the theory with experimental method, result and conclusion  |
|        |   |             |   | <b>BS - CH 191.4</b> | Students will learn how to effectively carry out a work done either in single or as a team member in the laboratory.             |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | ES - EE 191 | Basic Electrical Engineering Laboratory | <b>ES - EE 191.1</b> | Identify appropriate equipment and instruments for the experiment  |
|        |   |             |   | <b>ES - EE 191.2</b> | Test the instrument for application to the experiment.   |
|        |   |             |   | <b>ES - EE 191.3</b> | Construct circuits with appropriate instruments and safety precautions   |
|        |   |             |   | <b>ES - EE 191.4</b> | Validate different characteristics of DC machine , methods of speed control of DC motor ,Synchronous machine and Induction motor |
|        |   |             |   | <b>ES - EE 191.5</b> | Identify basic operation of power electronic   |
|        |   |             |   | <b>ES - EE 191.6</b> | Validate basic operation of power system.  |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | ES - ME 191 | Engineering Graphics & Design(Gr-B)     | <b>ES - ME 191.1</b> | Introduction to engineering design and its place in society  |
|        |   |             |   | <b>ES - ME 191.2</b> | Exposure to the visual aspects of engineering design   |
|        |   |             |   | <b>ES - ME 191.3</b> | Exposure to engineering graphics standards   |
|        |   |             |   | <b>ES - ME 191.4</b> | Exposure to solid modelling  |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | BS - PH 201 | Physics-I (Gr-B)                        | <b>BS - PH 201.1</b> | Recognise different concepts of mechanics and extend these concepts to identify real-world problems                              |

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|               |  |                  |                         | <b>BS - PH 201.2</b> | Illustrate optical phenomena like interference, diffraction, polarisation, and lasing action with physical and compact mathematical models.   |
|               |  |                  |                         | <b>BS - PH 201.3</b> | Classify different magnetic and dielectric materials and explain their properties.  |
|               |  |                  |                         | <b>BS - PH 201.4</b> | Demonstrate various quantum mechanical phenomena and solve numerical problems associated with them.   |
|               |  |                  |                         | <b>BS - PH 201.5</b> | Illustrate different types of statistical mechanics and use them to predict the behaviour of real-world particles   |
|               |  |                  |                         | <b>BS - PH 201.6</b> | Analyse different physical and numerical problems based on the knowledge of physics   |
| <b>EEE-UG</b> | <b>Electrical and Electronics Engineering (B.Tech)</b> | <b>BS- M 202</b> | <b>Mathematics –IIB</b> | <b>BS- M 202.1</b>   | Learn the methods for evaluating multiple integrals and their applications to different physical problems.  |
|               |  |                  |                         | <b>BS- M 202.2</b>   | Understand different techniques to solve first and second order ordinary differential equations with its formulation to address the modelling of systems and problems of engineering sciences |

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|        |   |            |                                 | <b>BS- M 202.3</b>  | Find the complete solution of a differential equation with constant coefficients by variation of parameters and student will have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients.. |
|        |   |            |                                 | <b>BS- M 202.4</b>  | Learn different tools of differentiation and integration of functions of a complex variable that are used with various other techniques for solving engineering problems.  |
|        |   |            |                                 | <b>BS- M 202.5</b>  | evaluate a contour integral using parametrization, fundamental theorem of calculus and Cauchy's integral formula and compute the residue of a function and use the residue theory to evaluate a contour integral or an integral over the real line;                      |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | ES -CS 201 | Programming for Problem Solving | <b>ES -CS 201.1</b> | To formulate simple algorithms for arithmetic and logical problems.  |
|        |   |            |                                 | <b>ES -CS 201.2</b> | To translate the algorithms to programs (in C language).   |
|        |   |            |                                 | <b>ES -CS 201.3</b> | To test and execute the programs and correct syntax and logical errors.  |
|        |   |            |                                 | <b>ES -CS 201.4</b> | To implement conditional branching, iteration and recursion.   |

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|        |   |           |         | <b>ES -CS 201.5</b> | To decompose a problem into functions and synthesize a complete program using divide and conquer approach.   |
|        |   |           |         | <b>ES -CS 201.6</b> | To use arrays, pointers and structures to formulate algorithms and programs.   |
|        |   |           |         | <b>ES -CS 201.7</b> | To apply programming to solve matrix addition and multiplication problems and searching and sorting problems.  |
|        |   |           |         | <b>ES -CS 201.8</b> | To apply programming to solve simple numerical method problems, namely root finding of function, differentiation of function and simple integration. |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | HM-HU 201 | English | <b>HM-HU 201.1</b>  | Develop confidence in the students so that they can acquire technical skills.  |
|        |   |           |         | <b>HM-HU 201.2</b>  | Build to implement the you – view point in business writing.   |
|        |   |           |         | <b>HM-HU 201.3</b>  | Demonstrate the role of communication at work place.   |
|        |   |           |         | <b>HM-HU 201.4</b>  | Build strong interpersonal skills, understand behaviour of team members and practice empathy towards others.   |
|        |   |           |         | <b>HM-HU 201.5</b>  | Explain four skills of English Language, Listening. Reading, speaking and writing.   |

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| EEE-UG | Electrical and Electronics Engineering (B.Tech) | BS PH -291 | Physics-I Laboratory (Gr-B)                | <b>BS PH -291.1</b> | Examine various semiconductor and dielectric properties (Hall coefficient, Bandgap, Dielectric constant) and relate the same to the theoretical laws they have learnt.    |
|        |   |            |  | <b>BS PH -291.2</b> | Determine various quantum mechanical constants (Stefan's-Boltzmann constant, Planck's constant, Lande-g factor, Rydberg constant)   |
|        |   |            |  | <b>BS PH -291.3</b> | Apply the concept of electrical properties of matter to determine different characteristics of materials and electrical devices.  |
|        |   |            |  | <b>BS PH -291.4</b> | Examine the characteristic of electronic motion under the influence of thermal energy and magnetic field for thermometric calibration and calculation of specific charge. |
|        |   |            |  | <b>BS PH -291.5</b> | Compute different fundamental elastic constants & general properties of matter.   |
|        |   |            |  | <b>BS PH -291.6</b> | Apply the concept of refraction, interference and diffraction to calculate the wavelength of light sources and optical properties of matter.                              |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | ES-CS 291  | Programming for Problem Solving Laboratory | <b>ES-CS 291.1</b>  | To formulate simple algorithms for arithmetic and logical problems.   |
|        |   |            |  | <b>ES-CS 291.2</b>  | To translate the algorithms to programs (in C language).  |

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|        |   |           |                     | <b>ES-CS 291.3</b> | To be able to correct syntax errors as reported by the compilers  |
|        |   |           |                     | <b>ES-CS 291.4</b> | To be able to identify and correct logical errors encountered at run time   |
|        |   |           |                     | <b>ES-CS 291.5</b> | To be able to write iterative as well as recursive programs   |
|        |   |           |                     | <b>ES-CS 291.6</b> | To be able to represent data in arrays, strings and structures and manipulate them through a program  |
|        |   |           |                     | <b>ES-CS 291.7</b> | To be able to declare pointers of different types and use them in defining self-referential structures.   |
|        |   |           |                     | <b>ES-CS 291.8</b> | To be able to create, read and write to and from simple text files.   |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | HM-HU 291 | Language Laboratory | <b>HM-HU 291.1</b> | Develop 'Listening Skill' and its sub skills through Language Lab Audio device;   |
|        |   |           |                     | <b>HM-HU 291.2</b> | Build 'Speaking Skill' and its sub skills   |
|        |   |           |                     | <b>HM-HU 291.3</b> | Explain Linguistic/Paralinguistic features (Pronunciation/Phonetics / Voice modulation/ Stress/ Intonation/ Pitch & Accent) of connected speech                     |
|        |   |           |                     | <b>HM-HU 291.4</b> | Improve 'Conversation Skill' using Language Lab Audio –Visual input; Conversational Practice Sessions (Face to Face / via Telephone, Mobile phone & Role Play Mode) |
|        |   |           |                     | <b>HM-HU 291.5</b> | Organize 'Group Discussion' through audio –Visual input and explain the key strategies for success.   |



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|        |   |            |  | <b>HM-HU 291.6</b>  | Develop 'Reading Skills' and its sub skills using Visual / Graphics/ Diagrams /Chart Display/Technical/Non-Technical Passages Learning Global / Contextual / Inferential Comprehension; |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | ES- ME 292 | Workshop/Manufacturing Practices(Gr-B) | <b>ES- ME 292.1</b> | fabricate components with their own hands.  |
|        |   |            |  | <b>ES- ME 292.2</b> | knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes  |
|        |   |            |  | <b>ES- ME 292.3</b> | produce small devices of their interest by assembling different components  |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE 301 | ELECTRIC CIRCUIT THEORY                | <b>PC-EEE-301.1</b> | Describe different type of networks, sources and signals with examples  |
|        |   |            |  | <b>PC-EEE-301.2</b> | Explain different network theorems, coupled circuit and tools for solution of networks.   |
|        |   |            |  | <b>PC-EEE-301.3</b> | Apply network theorems and different tools to solve network problems.   |
|        |   |            |  | <b>PC-EEE-301.4</b> | Select suitable techniques of network analysis for efficient solution.  |
|        |   |            |  | <b>PC-EEE-301.5</b> | Estimate parameters of two-port networks  |
|        |   |            |  | <b>PC-EEE-301.6</b> | Design filter circuits.   |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE 302 | ANALOG ELECTRONICS                     | <b>PC-EEE-302.1</b> | Describe analog electronic components and analog electronics circuits.  |
|        |   |            |  | <b>PC-EEE-302.2</b> | Explain principle of operation of analog electronic components, filters, regulators and analog electronic circuits.   |

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|               |  |                   |                                      | <b>PC-EEE-302.3</b> | Compute parameters and operating points of analog electronic circuits.  |
|               |  |                   |                                      | <b>PC-EEE-302.4</b> | Determine response of analog electronic circuits.   |
|               |  |                   |                                      | <b>PC-EEE-302.5</b> | Distinguish different types amplifier and different types oscillators based on application.                       |
|               |  |                   |                                      | <b>PC-EEE-302.6</b> | Construct operational amplifier based circuits for different applications.  |
| <b>EEE-UG</b> | <b>Electrical and Electronics Engineering (B.Tech)</b> | <b>PC-EEE 303</b> | <b>ELECTRO MAGNETIC FIELD THEORY</b> | <b>PC-EE-303.1</b>  | To relate different coordinate systems for efficient solution of electromagnetic problems.                        |
|               |  |                   |                                      | <b>PC-EE-303.2</b>  | To describe mathematical tools to solve electromagnetic problems.   |
|               |  |                   |                                      | <b>PC-EE-303.3</b>  | To explain laws applied to electromagnetic field.   |
|               |  |                   |                                      | <b>PC-EE-303.4</b>  | To apply mathematical tools and laws to solve electromagnetic problems.   |
|               |  |                   |                                      | <b>PC-EE-303.5</b>  | To analyze electromagnetic wave propagation.  |
|               |  |                   |                                      | <b>PC-EE-303.6</b>  | To estimate transmission line parameters.   |
| <b>EEE-UG</b> | <b>Electrical and Electronics Engineering (B.Tech)</b> | <b>ES-ME 301</b>  | <b>ENGINEERING MECHANICS</b>         | <b>ES-ME 301.1</b>  | explain the co-ordinate system, principle of three dimensional rotation, kinematics and kinetics of rigid bodies. |
|               |  |                   |                                      | <b>ES-ME 301.2</b>  | elaborate the theory of general motion, bending moment, torsional motion and friction.                            |
|               |  |                   |                                      | <b>ES-ME 301.3</b>  | develop free body diagram of different arrangements.  |

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|        |   |          |                       | <b>ES-ME 301.4</b> | solve problems with the application of theories and principle of motion , friction and rigid bodies.  |
|        |   |          |                       | <b>ES-ME 301.5</b> | analyze torsional motion and bending moment.  |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | BS-M 301 | MATHEMATICS-III       | <b>BS-M 301.1</b>  | explain basics of probability theories, rules, distribution and properties of Z transform   |
|        |   |          |                       | <b>BS-M 301.2</b>  | describe different methods of numerical analysis.   |
|        |   |          |                       | <b>BS-M 301.3</b>  | solve numerical problems based on probability theories , numerical analysis and Z transform   |
|        |   |          |                       | <b>BS-M 301.4</b>  | apply numerical methods to solve engineering problems.  |
|        |   |          |                       | <b>BS-M 301.5</b>  | solve engineering problems using z transform and probability theory.  |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | BS-301   | BIOLOGY FOR ENGINEERS | <b>BS-301.1</b>    | describe with examples the biological observations lead to major discoveries.   |
|        |   |          |                       | <b>BS-301.2</b>    | explain<br>a. the classification of kingdom of life<br>b. the building blocks of life<br>c. different techniques of bio physics used to study biological phenomena.<br>d. the role of imaging in the screening, diagnosis, staging, and treatments of cancer. |
|        |   |          |                       | <b>BS-301.3</b>    | identify DNA as a genetic material in the molecular basis of information transfer   |

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|        |   |            |                                    | <b>BS-301.4</b>     | analyze biological processes at the reductionistic level.   |
|        |   |            |                                    | <b>BS-301.5</b>     | apply thermodynamic principles to biological systems.   |
|        |   |            |                                    | <b>BS-301.6</b>     | identify microorganisms.  |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | MC-EEE 301 | INDIAN CONSTITUTION                | <b>MC-EE 301.1</b>  | describe<br>a. different features of Indian constitution..<br>b. power and functioning of Union, state and local self-government.<br>c. structure, jurisdiction and function of Indian Judiciary.<br>d. basics of PIL and guideline for admission of PIL.<br>e. Functioning of local administration starting from block to Municipal Corporation. |
|        |   |            |                                    | <b>MC-EE 301.2</b>  | identify authority to redress a problem in the profession and in the society.   |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE 391 | ELECTRIC CIRCUIT THEORY LABORATORY | <b>PC-EEE-391.1</b> | Determine a) transient response of different electrical circuit, b)parameters of two port network, c) frequency response of filters, d) Laplace transform and inverse Laplace transform   |
|        |   |            |                                    | <b>PC-EEE-391.2</b> | Generate different signals in both discrete and analog form   |
|        |   |            |                                    | <b>PC-EEE-391.3</b> | Analyze amplitude and phase spectrum of different signals   |
|        |   |            |                                    | <b>PC-EEE-391.4</b> | Verify network theorems   |
|        |   |            |                                    | <b>PC-EEE-391.5</b> | Construct circuits with appropriate instruments and safety precautions  |

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|        |   |            |                               | <b>PC-EEE-391.6</b> | Simulate electrical circuit experiments using suitable software.   |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE 392 | ANALOG ELECTRONICS LABORATORY | <b>PC-EEE-392.1</b> | Determine :<br>Characteristics of full wave rectifier with filter and without filter ,Characteristics of BJT and FET, Characteristics of Zener diode as voltage regulator, Characteristics of class A, C and push pull amplifiers.   |
|        |   |            |                               | <b>PC-EEE-392.2</b> | Verify function of DAC and ADC.  |
|        |   |            |                               | <b>PC-EEE-392.3</b> | Construct: function generator using IC • R-C coupled amplifier • linear voltage regulator using regulator IC chip. • Timer circuit using 555 for monostable, astable and multistable multivibrator. • V to I and I to V converter with Op amps. • phase locked loop using Voltage Controlled |
|        |   |            |                               | <b>PC-EEE-392.4</b> | Work in a team Oscillator (VCO).   |
|        |   |            |                               | <b>PC-EEE-392.5</b> | Validate theoretical learning with practical.  |
|        |   |            |                               |                     |  |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-CS 391  | NUMERICAL METHODS LABORATORY  | <b>PC-CS 391.1</b>  | Develop numerical methods for approximately solving problems   |
|        |   |            |                               | <b>PC-CS 391.2</b>  | Examine the accuracy of these methods  |
|        |   |            |                               | <b>PC-CS 391.3</b>  | Examine the failure modes of these methods   |

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|        |   |            |                     | <b>PC-CS 391.4</b>  | Demonstrate knowledge and understanding of numerical methods to solve systems of linear equations, to compute quadrature and to solve Ordinary and Partial Differential Equations |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE 401 | ELECTRIC MACHINE-I  | <b>PC-EEE-401.1</b> | Describe the function of different components of magnetic circuit, DC machines and transformers   |
|        |   |            |                     | <b>PC-EEE-401.2</b> | Explain the principle of operation of different types of DC machines and transformers   |
|        |   |            |                     | <b>PC-EEE-401.3</b> | Solve numerical problems of DC machines and transformers  |
|        |   |            |                     | <b>PC-EEE-401.4</b> | Estimate the parameters and efficiency of transformer.  |
|        |   |            |                     | <b>PC-EEE-401.5</b> | Determine the characteristics of DC machines  |
|        |   |            |                     | <b>PC-EEE-401.6</b> | Recommend methods to control output of DC machines.   |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE 402 | DIGITAL ELECTRONICS | <b>PC-EEE-402.1</b> | Describe the function of different building blocks of digital electronics, semiconductor memories and programmable logic devices.   |
|        |   |            |                     | <b>PC-EEE-402.2</b> | Explain the principle of operation of combinational and sequential digital circuits, A/D and D/A convert.   |

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|               |  |                   |  | <b>PC-EEE-402.3</b> | Solve numerical problems of Boolean algebra, number system, combinational & sequential digital circuits and A/D and D/A converter.   |
|               |  |                   |  | <b>PC-EEE-402.4</b> | Specify applications of combinational and sequential digital circuits.   |
|               |  |                   |  | <b>PC-EEE-402.5</b> | Determine specifications of different digital circuits.  |
|               |  |                   |  | <b>PC-EEE-402.6</b> | Design combinational and sequential digital circuits.  |
| <b>EEE-UG</b> | <b>Electrical and Electronics Engineering (B.Tech)</b> | <b>PC-EEE-403</b> | <b>ELECTRICAL &amp; ELECTRONICS MEASUREMENTS</b> | <b>PC-EEE-403.1</b> | Explain the terms accuracy, precision, resolution, speed of response, errors in measurement, loading effect  |
|               |  |                   |  | <b>PC-EEE-403.2</b> | Describe methods of measurement of power, energy by instruments and resistance, capacitance and inductance by bridges and potentiometer  |
|               |  |                   |  | <b>PC-EEE-403.3</b> | Explain the principle of operation of analog meters, instrument transformer, digital multimeter, digital voltmeter, digital frequency meter, signal generator, strain gauge, LVDT and temperature transducers. |

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|               |  |                   |  | <b>PC-EEE-403.4</b> | Explain the different building block, principle of operation of oscilloscope and measurement techniques of voltage, current, frequency and phase by oscilloscope |
|               |  |                   |  | <b>PC-EEE-403.5</b> | Solve numerical problems related to analog meters, instrument transformer, measurement of power, energy, resistance, inductance and capacitance.                 |
|               |  |                   |  | <b>PC-EEE-403.6</b> | Specify applications of analog and digital measuring instruments, sensors and transducers  |
| <b>EEE-UG</b> | <b>Electrical and Electronics Engineering (B.Tech)</b> | <b>ES-ME-401</b>  | <b>THERMAL POWER ENGINEERING</b>       | <b>ES-ME-401.1</b>  | describe the function of different components of boilers. Engines and turbines   |
|               |  |                   |  | <b>ES-ME-401.2</b>  | explain the principle of operation of different types of boilers, turbines, IC engines and Gas turbines.   |
|               |  |                   |  | <b>ES-ME-401.3</b>  | solve numerical problems of boilers, turbines, IC engines and Gas turbines.  |
|               |  |                   |  | <b>ES-ME-401.4</b>  | analyze the performance of boilers, engines and turbines.  |
|               |  |                   |  | <b>ES-ME-401.5</b>  | determine efficiency of boilers, engines and turbines.   |
|               |  |                   |  | <b>ES-ME-401.6</b>  | explain methods to control boiler, engines and turbines parameters.  |
| <b>EEE-UG</b> | <b>Electrical and Electronics Engineering (B.Tech)</b> | <b>HM-EEE-401</b> | <b>VALUES AND ETHICS IN PROFESSION</b> | <b>HM-EE-401.1</b>  | illustrate different aspects of human values, ethics, engineers' responsibility and duties   |



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|               |   |                   |                                      | <b>HM-EE-401.2</b>  | explain different principles, different theories and laws of engineering ethics and social experimentation    |
|               |   |                   |                                      | <b>HM-EE-401.3</b>  | identify different factors in the light of Engineers' responsibility towards safety and risk                  |
|               |   |                   |                                      | <b>HM-EE-401.4</b>  | correlate ethics of different work environment.   |
|               |   |                   |                                      | <b>HM-EE-401.5</b>  | explain the need for intellectual property rights.  |
| <b>EEE-UG</b> | Electrical and Electronics Engineering (B.Tech) | <b>MC-EEE-401</b> | <b>ENVIRONMENTAL SCIENCE</b>         | <b>MC-EE-401.1</b>  | understand the natural environment and its relationships with human activities                                |
|               |   |                   |                                      | <b>MC-EE-401.2</b>  | apply the fundamental knowledge of science and engineering to assess environmental and health risk            |
|               |   |                   |                                      | <b>MC-EE-401.3</b>  | develop guidelines and procedures for health and safety issues obeying the environmental laws and regulations |
|               |   |                   |                                      | <b>MC-EE-401.4</b>  | acquire skills for scientific problem-solving related to air, water, noise & land pollution.                  |
| <b>EEE-UG</b> | Electrical and Electronics Engineering (B.Tech) | <b>PC-EEE-491</b> | <b>ELECTRIC MACHINE-I LABORATORY</b> | <b>PC-EEE-491.1</b> | Identify appropriate equipment and instruments for the experiment   |
|               |   |                   |                                      | <b>PC-EEE-491.2</b> | Test the instrument for application to the experiment.  |
|               |   |                   |                                      | <b>PC-EEE-491.3</b> | Construct circuits with appropriate instruments and safety precautions  |

|        |   |            |   |                     |   |
|--------|---|------------|---|---------------------|---|
|        |   |            |   | <b>PC-EEE-491.4</b> | Validate different characteristics of DC machine , methods of speed control of DC motor and parallel operation of the transformer           |
|        |   |            |   | <b>PC-EEE-491.5</b> | work effectively in a team  |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE-492 | DIGITAL ELECTRONICS LABORATORY                  | <b>PC-EEE-492.1</b> | Identify appropriate equipment and instruments for the experiment.  |
|        |   |            |   | <b>PC-EEE-492.1</b> | Test the instruments for application to the experiment  |
|        |   |            |   | <b>PC-EEE-492.1</b> | Construct Decoder, multiplexer, adder, and subtractor circuits with appropriate instruments and safety precautions.                         |
|        |   |            |   | <b>PC-EEE-492.1</b> | Realize RS-JK and D flip flop, universal register with gates, multiplexer and flip-flops and asynchronous and synchronous up down counters. |
|        |   |            |   | <b>PC-EEE-492.1</b> | Validate the operation of code conversion circuit - BCD to excess 3 & vice versa, 4 bit parity generator, & comparator circuits.            |
|        |   |            |   | <b>PC-EEE-492.1</b> | Work effectively in a team.   |
|        |   |            |   | <b>PC-EEE-493.1</b> | Identify appropriate equipment and instruments for the experiment   |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE-493 | ELECTRICAL & ELECTRONICS MEASUREMENT LABORATORY | <b>PC-EEE-493.2</b> | Test the instrument for application to the experiment   |
|        |   |            |   | <b>PC-EEE-493.3</b> | Construct circuits with appropriate instruments and safety precautions  |

|               |  |                   |   |                     |  |
|---------------|--|-------------------|---|---------------------|--|
|               |  |                   |   | <b>PC-EEE-493.4</b> | Evaluate and adjust the precision and accuracy of AC energy meter, moving iron and dynamometer type ammeter, voltmeter and wattmeter by potentiometer                                      |
|               |  |                   |   | <b>PC-EEE-493.5</b> | Measure voltage, current, power, energy, phase, frequency, resistance, inductance, capacitance   |
|               |  |                   |   | <b>PC-EEE-493.6</b> | Work effectively in a team   |
| <b>EEE-UG</b> | <b>Electrical and Electronics Engineering (B.Tech)</b> | <b>ES-ME-491</b>  | <b>THERMAL POWER ENGINEERING LABORATORY</b> | <b>ES-ME-491.1</b>  | identify appropriate equipment and instruments for the experiment  |
|               |  |                   |   | <b>ES-ME-491.2</b>  | construct experimental setup with appropriate instruments and safety precautions   |
|               |  |                   |   | <b>ES-ME-491.3</b>  | identify different parts of Lanchashire Boiler, Bahcock & Willcox Boiler, Cochran Boiler, Vertical Tubular Boiler, Locomotive Boiler, 4S Diesel Engine, 4S Petrol Engine, 2S Petrol engine |
|               |  |                   |   | <b>ES-ME-491.4</b>  | test 4 stroke petrol engine by electrical load box and diesel engine by electrical load box and rope brake dynamometer   |
|               |  |                   |   | <b>ES-ME-491.5</b>  | find calorific value, flash point, fire point, cloud point, pour point of fuel.  |
|               |  |                   |   | <b>ES-ME-491.6</b>  | work effectively in a team   |
| <b>EEE-UG</b> | <b>Electrical and Electronics Engineering (B.Tech)</b> | <b>PC-EEE-501</b> | <b>ELECTRIC MACHINERY-II</b>                | <b>PC-EEE-501.1</b> | describe the arrangement of winding of AC machines.  |

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|--------|---|------------|----------------|---------------------|--|
|        |   |            |                | <b>PC-EEE-501.2</b> | explain the principle of operation of Induction machines, Synchronous machines and special machines. |
|        |   |            |                | <b>PC-EEE-501.3</b> | solve numerical problems of Induction machines, Synchronous machines and Special machines.           |
|        |   |            |                | <b>PC-EEE-501.4</b> | estimate the parameters and efficiency of Induction machines and Synchronous machines.               |
|        |   |            |                | <b>PC-EEE-501.5</b> | determine the characteristics of Induction machines and Synchronous machines.                        |
|        |   |            |                | <b>PC-EEE-501.6</b> | select appropriate methods for starting , braking and speed control of Induction machines.           |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE-502 | POWER SYSTEM-I | <b>PC-EEE-502.1</b> | Explain the principle of generation of Electric power from different sources.                        |
|        |   |            |                | <b>PC-EEE-502.2</b> | Determine parameters of transmission lines and its performance.                                      |
|        |   |            |                | <b>PC-EEE-502.3</b> | Explain the principle of formation of corona and methods of its reduction.                           |
|        |   |            |                | <b>PC-EEE-502.4</b> | Conduct electrical tests on insulators.  |
|        |   |            |                | <b>PC-EEE-502.5</b> | Solve numerical problems related to overhead transmission line, cable, insulators and tariff.        |
|        |   |            |                | <b>PC-EEE-502.6</b> | Analyze overhead transmission line based on short medium and long lines.                             |

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| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE-503 | CONTROL SYSTEM    | <b>PC-EEE-503.1</b> | Develop mathematical model of mechanical, electrical, thermal, fluid system and different control system components like servomotors, synchros, potentiometer, tachogenerators etc.  |
|        |   |            |                   | <b>PC-EEE-503.2</b> | Analyse stability of LTI system using routh-hurwitz (RH) criteria, root locus techniques in time domain and bode plot and nyquist technique in frequency domain.   |
|        |   |            |                   | <b>PC-EEE-503.3</b> | Design different control law or algorithms like proportional control, proportional plus derivative(PD) control, proportional plus integration(PI) control, and proportional plus integration plus derivative (PID) control and compensators like lag, lead, lag-lead for LTI systems |
|        |   |            |                   | <b>PC-EEE-503.4</b> | Apply state variable techniques for analysis of linear systems.  |
|        |   |            |                   | <b>PC-EEE-503.5</b> | Analyze the stability of linear discrete system.   |
|        |   |            |                   | <b>PC-EEE-503.6</b> | Solve numerical problems on LTI system modelling, responses, error dynamics and stability .  |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE-504 | POWER ELECTRONICS | <b>PC-EEE-504.1</b> | understand the differences between signal level and power level devices  |

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|               |  |                    |  | <b>PC-EEE-504.2</b>  | construct triggering and commutation circuits of SCR  |
|               |  |                    |  | <b>PC-EEE-504.3</b>  | explain the principle of operation of AC-DC, DC-DC and DC-AC converters.  |
|               |  |                    |  | <b>PC-EEE-504.4</b>  | analyse the performance of AC-DC, DC-DC and DC-AC converters  |
|               |  |                    |  | <b>PC-EEE-504.5</b>  | apply methods of voltage control and harmonic reduction to inverters.   |
|               |  |                    |  | <b>PC-EEE-504.6</b>  | solve numerical problems of switching devices, AC-DC, DC-DC and DC-AC converters.   |
| <b>EEE-UG</b> | <b>Electrical and Electronics Engineering (B.Tech)</b> | <b>OE-EEE-501B</b> | <b>OBJECT ORIENTED PROGRAMMING</b>             | <b>OE-EEE-501B.1</b> | Specify simple abstract data types and design implementations, using abstraction functions to document them.  |
|               |  |                    |  | <b>OE-EEE-501B.2</b> | Recognise features of object-oriented design such as encapsulation, polymorphism, inheritance, and composition of systems based on object identity.     |
|               |  |                    |  | <b>OE-EEE-501B.3</b> | Name and apply some common object-oriented design patterns and give examples of their use.  |
|               |  |                    |  | <b>OE-EEE-501B.4</b> | Design applications with an event-driven graphical user interface.  |
| <b>EEE-UG</b> | <b>Electrical and Electronics Engineering (B.Tech)</b> | <b>PE-EEE-501C</b> | <b>RENEWABLE &amp; NON CONVENTIONAL ENERGY</b> | <b>PE-EEE-501C.1</b> | Explain the principle of conversion of solar energy, wind energy, biomass, Geothermal energy, Ocean energy and Hydrogen energy to other form of energy. |

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|        |   |            |                                | <b>PE-EEE-501C.2</b> | Explain the principle of operation of magneto hydrodynamic power generation.   |
|        |   |            |                                | <b>PE-EEE-501C.3</b> | Use Solar energy, Wind energy , Biomass, Geothermal energy, Ocean energy, Hydrogen energy and fuel cell for different applications.  |
|        |   |            |                                | <b>PE-EEE-501C.4</b> | Suggest location to set up wind mill and biogas generation plant   |
|        |   |            |                                | <b>PE-EEE-501C.5</b> | Estimate conversion efficiency of fuel cell.   |
|        |   |            |                                | <b>PE-EEE-501C.6</b> | Solve numerical problems relating to conversion of Solar energy, Wind energy , Biomass, Ocean energy and Hydrogen energy to heat and electric energy.  |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE-591 | ELECTRIC MACHINE-II LABORATORY | <b>PC-EEE-591.1</b>  | identify appropriate equipment and instruments for the experiment.   |
|        |   |            |                                | <b>PC-EEE-591.2</b>  | test the instrument for application to the experiment.   |
|        |   |            |                                | <b>PC-EEE-591.3</b>  | construct circuits with appropriate instruments and safety precautions.  |
|        |   |            |                                | <b>PC-EEE-591.4</b>  | validate different characteristics of single phase Induction motor, three phase Induction motor, Induction generator and synchronous motor , methods of speed control of Induction motors and parallel operation of the 3 phase Synchronous generator. |
|        |   |            |                                | <b>PC-EEE-591.5</b>  | work effectively in a team   |

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|--------|---|------------|------------------------------|--------------|---|
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE-592 | CONTROL SYSTEM LABORATORY    | PC-EEE-592.1 | Identify appropriate equipment and instruments for the experiment.  |
|        |   |            |                              | PC-EEE-592.2 | test the instrument for application to the experiment.  |
|        |   |            |                              | PC-EEE-592.3 | construct circuits with appropriate instruments and safety precautions.   |
|        |   |            |                              | PC-EEE-592.4 | Use MAT-Lab control system tool box, MAT-Lab- simulink tool box & PSPICE for simulation of systems.                     |
|        |   |            |                              | PC-EEE-592.5 | Determine control system specifications of first and second order systems.  |
|        |   |            |                              | PC-EEE-592.6 | Validate step response & impulse response for type-0, type-1 & Type-2 system with unity feedback using MATLAB & PSPICE. |
|        |   |            |                              | PC-EEE-592.7 | Work effectively in a team.   |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE-593 | POWER ELECTRONICS LABORATORY | PC-EEE-593.1 | Identify appropriate equipment and instruments for the experiment.  |
|        |   |            |                              | PC-EEE-593.2 | Test the instrument for application to the experiment.  |
|        |   |            |                              | PC-EEE-593.3 | Construct circuits with appropriate instruments and safety precautions.   |
|        |   |            |                              | PC-EEE-593.4 | Validate characteristics of SCR, Triac, and performance of phase controlled converter, DC-DC converter and inverters.   |
|        |   |            |                              | PC-EEE-593.5 | Work effectively in a team.   |



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| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE-601  | POWER SYSTEM-II                    | <b>PC-EEE-601.1</b>  | represent power system components in line diagrams   |
|        |   |             |                                    | <b>PC-EEE-601.2</b>  | determine the location distribution substation   |
|        |   |             |                                    | <b>PC-EEE-601.3</b>  | determine the performance of power system with the help of load flow studies.                      |
|        |   |             |                                    | <b>PC-EEE-601.4</b>  | analyse faults in Electrical systems   |
|        |   |             |                                    | <b>PC-EEE-601.5</b>  | determine the stability of Power system.   |
|        |   |             |                                    | <b>PC-EEE-601.6</b>  | explain principle of operation of different power system protection equipments.                    |
|        |   |             |                                    | <b>PC-EEE-601.7</b>  | solve numerical problems related to representation, load flow, faults, stability and protection of |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE-602  | MICRO PROCESSOR & MICRO CONTROLLER | <b>PC-EEE-602.1</b>  | Explain the architecture of 8086 and 8051.   |
|        |   |             |                                    | <b>PC-EEE-602.2</b>  | Do assembly language programming of 8086, 8051   |
|        |   |             |                                    | <b>PC-EEE-602.3</b>  | Interface different peripheral with 8086 and 8051  |
|        |   |             |                                    | <b>PC-EEE-602.4</b>  | Develop micro processor/ microcontroller based systems   |
|        |   |             |                                    | <b>PC-EEE-602.5</b>  | Compare microprocessor, microcontroller, PIC and ARM processors                                    |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PE-EEE-601C | VLSI AND MICRO ELECTRONICS         | <b>PE-EEE-601C.1</b> | Explain the principle of design of VLSI circuits   |
|        |   |             |                                    | <b>PE-EEE-601C.2</b> | Explain different MOS structure with characteristics   |
|        |   |             |                                    | <b>PE-EEE-601C.3</b> | Apply different processes for VLSI fabrication   |
|        |   |             |                                    | <b>PE-EEE-601C.4</b> | Use programming language for the design of logic circuits  |

|        |   |             |                             |                      |   |
|--------|---|-------------|-----------------------------|----------------------|---|
|        |   |             |                             | <b>PE-EEE-601C.5</b> | Draw the stick diagram and layout for simple MOS circuits   |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PE-EEE-602B | POWER QUALITY AND FACTS     | <b>PE-EEE-602B.1</b> | Analyse uncompensated AC transmission line  |
|        |   |             |                             | <b>PE-EEE-602B.2</b> | Explain the working principles of FACTS devices and their operating characteristics                               |
|        |   |             |                             | <b>PE-EEE-602B.3</b> | Apply FACTS devices for power flow control and stability.   |
|        |   |             |                             | <b>PE-EEE-602B.4</b> | Identify different issues of power quality in distribution system   |
|        |   |             |                             | <b>PE-EEE-602B.5</b> | Apply different compensation and control techniques for DSTATCOM  |
|        |   |             |                             | <b>PE-EEE-602B.6</b> | Explain working principle of dynamic voltage restorer and UPQC  |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | OE-EEE-601B | DATABASE MANAGEMENT SYSTEMS | <b>OE-EEE-601B.1</b> | For a given query write relational algebra expressions for that query and optimize the developed expressions      |
|        |   |             |                             | <b>OE-EEE-601B.2</b> | For a given specification of the requirement design the databases using E R method and normalization.             |
|        |   |             |                             | <b>OE-EEE-601B.3</b> | For a given specification construct the SQL queries for Open source and Commercial DBMS - MYSQL, ORACLE, and DB2. |
|        |   |             |                             | <b>OE-EEE-601B.4</b> | For a given query optimize its execution using Query optimizationalgorithms                                       |

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|        |   |            |                            | <b>OE-EEE-601B.5</b> | For a given transaction-processing system, determine the transaction atomicity, consistency, isolation, and durability   |
|        |   |            |                            | <b>OE-EEE-601B.6</b> | Implement the isolation property, including locking, time stamping based on concurrency control and Serializability of scheduling.   |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | HM-EEE-601 | ECONOMICS FOR ENGINEERS    | <b>HM-EEE 601.1</b>  | evaluate the economic theories, cost concepts and pricing policies   |
|        |   |            |                            | <b>HM-EEE 601.2</b>  | explain the market structures and integration concepts   |
|        |   |            |                            | <b>HM-EEE 601.3</b>  | apply the concepts of financial management for project appraisal   |
|        |   |            |                            | <b>HM-EEE 601.4</b>  | explain accounting systems, the impact of inflation, taxation, depreciation  |
|        |   |            |                            | <b>HM-EEE 601.5</b>  | analyze financial statements using ratio analysis  |
|        |   |            |                            | <b>HM-EEE 601.6</b>  | explain financial planning, economic basis for replacement, project scheduling, legal and regulatory issues applied to economic investment and project-management problems |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE-691 | POWER SYSTEM-II LABORATORY | <b>PC-EEE-691.1</b>  | Identify appropriate equipment and instruments for the experiment.   |
|        |   |            |                            | <b>PC-EEE-691.2</b>  | Test the instruments for application to the experiment   |
|        |   |            |                            | <b>PC-EEE-691.3</b>  | Construct circuits with appropriate instruments and safety precautions.  |

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|               |  |                   |  | <b>PC-EEE-691.4</b> | validate the characteristics of under voltage relay, over current relay, earth fault relay, on load time delay relay, off load time delay relay, CT and PT. |
|               |  |                   |  | <b>PC-EEE-691.5</b> | Validate the protection scheme of Generator, Motor and feeder.  |
|               |  |                   |  | <b>PC-EEE-691.6</b> | Apply software tools to find bus voltage, currents and power flows throughout the electrical system.  |
|               |  |                   |  | <b>PC-EEE-691.7</b> | Work effectively in a team.   |
| <b>EEE-UG</b> | <b>Electrical and Electronics Engineering (B.Tech)</b> | <b>PC-EEE-692</b> | <b>MICROPROCESSOR AND MICROCONTROLLER LABORATORY</b> | <b>PC-EEE-692.1</b> | Identify appropriate equipment and instruments for the experiment   |
|               |  |                   |  | <b>PC-EEE-692.2</b> | Test the instrument for application to the experiment   |
|               |  |                   |  | <b>PC-EEE-692.3</b> | Construct circuits with appropriate instruments and safety precautions  |
|               |  |                   |  | <b>PC-EEE-692.4</b> | Program 8086 for arithmetic operation, sorting of array, searching for a number in a string and string manipulation   |
|               |  |                   |  | <b>PC-EEE-692.5</b> | Interface ADC/DAC, 8255, 8251 to 8086 and LCD, keyboard to 8051   |
|               |  |                   |  | <b>PC-EEE-692.6</b> | Program 8051 using arithmetic, logical and bit manipulation instructions of 8051  |
|               |  |                   |  | <b>PC-EEE-692.7</b> | Work effectively in a team  |

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| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE 681  | ELECTRICAL AND ELECTRONICS DESIGN LABORATORY | <p><b>PC-EEE-681.1</b> explain basic concept of measurement, noise in electronic system, sensor and signal conditioning circuits.</p> <p><b>PC-EEE-681.2</b> Impliment PC based data aquisition system.</p> <p><b>PC-EEE-681.3</b> Construct circuits with appropriate instruments and safety precautions.</p> <p><b>PC-EEE-681.4</b> Design heating elements, air core grounding reactor, power distribution system for small township, double circuit transmission line and Electric machines.</p> <p><b>PC-EEE-681.5</b> Do wiring and installation design of a multistoried residential building with lift and pump</p> <p><b>PC-EEE-681.6</b> Design electronic hardware for controller of lift, speed of AC/ DC motor, and for an application with analog, digital, mixed signal, microcontroller and PCB</p> |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PE-EEE-601C | VLSI & Microelectronics                      | <p><b>PE-EEE-601C.1</b> Explain the Principle of design of VLSI circuits</p> <p><b>PE-EEE-601C.2</b> Explain different MOS structure with characteristics</p> <p><b>PE-EEE-601C.3</b> Apply different processes for VLSI fabrication</p> <p><b>PE-EEE-601C.4</b> Use programming language for the design of logic circuits</p> <p><b>PE-EEE-601C.5</b> Draw the stick diagram and layout for simple MOS circuits</p>  |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE 701  | UG AND DIGITAL COMM                          | <p><b>PC-EEE -701.1</b> To explain the principle of amplitude, frequency and phase modulations .</p>  |

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|--------|---|-------------|-----------------|----------------------|---|
|        |   |             |                 | <b>PC-EEE -701.2</b> | To apply error detection and correction techniques  |
|        |   |             |                 | <b>PC-EEE -701.3</b> | To compare different types of digital modulation techniques.  |
|        |   |             |                 | <b>PC-EEE -701.4</b> | To explain data communication systems   |
|        |   |             |                 | <b>PC-EEE -701.5</b> | To estimate noise in communication systems  |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PE-EEE 701A | ELECTRIC DRIVE  | <b>PE-EEE 701A.1</b> | explain the principle of operation of Electric Drive.   |
|        |   |             |                 | <b>PE-EEE 701A.2</b> | describe different methods of starting and braking of Electric Drive.   |
|        |   |             |                 | <b>PE-EEE 701A.3</b> | model and control DC Drive  |
|        |   |             |                 | <b>PE-EEE 701A.4</b> | control speed of Induction and Synchronous motors.  |
|        |   |             |                 | <b>PE-EEE 701A.5</b> | recommend drives for different applications.  |
|        |   |             |                 | <b>PE-EEE 701A.6</b> | estimate ratings, variables and parameters of Electric Drives.  |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | OE-EEE 701A | EMBEDDED SYSTEM | <b>OE-EEE 701A.1</b> | discuss the definition, purpose, application, classification , quality characteristics and attributes of Embedded Systems |
|        |   |             |                 | <b>OE-EEE 701A.2</b> | explain the internal structure of the Embedded system.  |
|        |   |             |                 | <b>OE-EEE 701A.3</b> | interface IO devices and other peripherals with micro controllers in Embedded systems.                                    |
|        |   |             |                 | <b>OE-EEE 701A.4</b> | write programs for Micro controllers in Embedded systems.   |
|        |   |             |                 | <b>OE-EEE 701A.5</b> | apply the concept of Embedded firmware in design of Embedded systems.   |

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|        |   |             |                           | <b>OE-EEE 701A.6</b> | design RTOS based Embedded systems.   |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | OE-EEE-702B | COMPUTER GRAPHICS         | <b>OE-EEE-702B.1</b> | explain Computer graphics and graphic systems.  |
|        |   |             |                           | <b>OE-EEE-702B.2</b> | test and implement line drawing algorithm, circle and ellipse drawing algorithm, area filling algorithms.   |
|        |   |             |                           | <b>OE-EEE-702B.3</b> | Perform 2D and 3D transformation and viewing.   |
|        |   |             |                           | <b>OE-EEE-702B.4</b> | apply algorithms for visible surface determination.   |
|        |   |             |                           | <b>OE-EEE-702B.5</b> | explain colors and shading models and ray tracing.  |
|        |   |             |                           |                      |   |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | HM-EEE 701  | PRINCIPLE OF MANAGEMENT   | <b>HM-EEE 701.1</b>  | explain the concepts and approaches of management.  |
|        |   |             |                           | <b>HM-EEE 701.2</b>  | demonstrate the roles, skills and functions of management.  |
|        |   |             |                           | <b>HM-EEE 701.3</b>  | diagnose and solve organizational problems.   |
|        |   |             |                           | <b>HM-EEE 701.4</b>  | identify the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities. |
|        |   |             |                           | <b>HM-EEE 701.5</b>  | apply different methods of Customer, Operation and Technology management.   |
|        |   |             |                           | <b>HM-EEE 701.6</b>  | acquire skills of good leader in an organization.   |
| EEE-UG | Electrical and Electronics Engineering (B.Tech) | PC-EEE 791  | AND DIGITAL COMMUNICATION | <b>PC-EEE-791.1</b>  | To identify appropriate equipment and instruments for the experiment  |

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|               |   |                    |                                  | <b>PC-EEE-791.2</b>  | To test the instrument for application to the experiment  |
|               |   |                    |                                  | <b>PC-EEE-791.3</b>  | To construct circuits with appropriate instruments and safety precautions                       |
|               |   |                    |                                  | <b>PC-EEE-791.4</b>  | To apply different methods of modulations and demodulation in the laboratory                    |
|               |   |                    |                                  | <b>PC-EEE-791.5</b>  | To analyse experimental data obtained in the laboratory   |
|               |   |                    |                                  | <b>PC-EEE-791.6</b>  | To work effectively in a team   |
| <b>EEE-UG</b> | Electrical and Electronics Engineering (B.Tech) | <b>PC-EEE-801</b>  | <b>DIGITAL SIGNAL PROCESSING</b> | <b>PC-EEE 801.1</b>  | represent signals mathematically in continuous and discrete-time and in the frequency domain    |
|               |   |                    |                                  | <b>PC-EEE 801.2</b>  | analyse discrete-time systems using z-transform.  |
|               |   |                    |                                  | <b>PC-EEE 801.3</b>  | explain the Discrete-Fourier Transform (DFT) and the FFT algorithms.                            |
|               |   |                    |                                  | <b>PC-EEE 801.4</b>  | design digital filters for various applications   |
|               |   |                    |                                  | <b>PC-EEE 801.5</b>  | apply digital signal processing for the analysis of real-life signals                           |
| <b>EEE-UG</b> | Electrical and Electronics Engineering (B.Tech) | <b>PE-EEE 801B</b> | <b>ADVANCED ELECTRIC DRIVE</b>   | <b>PE-EEE 801B.1</b> | explain the principle of operation of converters for AC drives.                                 |
|               |   |                    |                                  | <b>PE-EEE 801B.2</b> | model Induction and Synchronous motor by reference frame theory.                                |
|               |   |                    |                                  | <b>PE-EEE 801B.3</b> | apply different control methods to control speed and torque of Induction and Synchronous motor. |



|               |  |                    |   |                      |   |
|---------------|--|--------------------|---|----------------------|---|
|               |  |                    |   | <b>PE-EEE 801B.4</b> | explain the configurations and method of speed control of BLDC, PMSM and SRM.   |
|               |  |                    |   | <b>PE-EEE 801B.5</b> | realize basic blocks for DSP based motion control.  |
|               |  |                    |   | <b>PE-EEE 801B.6</b> | develop appropriate scheme for speed control of Induction and Synchronous motor.  |
| <b>EEE-UG</b> | <b>Electrical and Electronics Engineering (B.Tech)</b> | <b>OE-EEE 801D</b> | <b>SENSORS AND TRANSDUCERS</b>              | <b>OE-EEE-801D.1</b> | Explain the basic principle of operation of Transducers and Sensors.  |
|               |  |                    |   | <b>OE-EEE-801D.2</b> | Distinguish different sensors and transducers.  |
|               |  |                    |   | <b>OE-EEE-801D.3</b> | Identify suitable transducer by comparing different industrial standards and procedures for measurement of physical parameters. |
|               |  |                    |   | <b>OE-EEE-801D.4</b> | Estimate the performance of different transducers.  |
|               |  |                    |   | <b>OE-EEE-801D.5</b> | Design real life electronics and instrumentation measurement systems.   |
|               |  |                    |   | <b>OE-EEE-801D.6</b> | Apply smart sensors, bio-sensors, PLC and Internet of Things to different applications.   |
| <b>EEE-UG</b> | <b>Electrical and Electronics Engineering (B.Tech)</b> | <b>PC-EEE 891</b>  | <b>DIGITAL SIGNAL PROCESSING LABORATORY</b> | <b>PC-EEE 891.1</b>  | identify appropriate simulator / equipments and instruments for the experiment.   |
|               |  |                    |   | <b>PC-EEE 891.2</b>  | test the simulator / instruments for application to the experiment.   |
|               |  |                    |   | <b>PC-EEE 891.3</b>  | construct algorithm / circuits with appropriate simulator/ instruments and safety precautions.                                  |

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|--|--|--|--|---------------------|--|
|  |  |  |  | <b>PC-EEE 891.4</b> | verify different algorithms and operations in the laboratory |
|  |  |  |  | <b>PC-EEE 891.5</b> | analyse experimental data obtained in the laboratory         |
|  |  |  |  | <b>PC-EEE 891.6</b> | work effectively in a team                                   |