Institute of Engineering and Technology, Agra

Vision of the Institution: To be a leading Institute offering quality technical education, research and preparing technocrats with applicable knowledge for meeting or fulfilling the needs of the industry and society

Mission of the Institution:

M1: To introduce quality programmes with an updated curriculum in the thrust area of the technology. **M2:** To provide the state-of-the-art infrastructure and employ competent and committed human resource for carrying out teaching and research.

M3: To create and nurture a conducive environment for teaching-learning using modern tools, research and critical thinking.

M4: To produce technocrats and entrepreneurs who are responsible and are adaptable towards the changing needs of industry.

Programme Outcomes (POs)

The graduates of Electronics and Communication Engineering will be able to:

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

PO – 2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO – 3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO – 4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO – 5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO – 6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO – 7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO – 8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

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

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

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

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

Electrical Engineering Department

VISION

- To produce competent Electrical Engineers by imparting quality education and make them industry ready to serve the society.

MISSION

- To nurture a conducive academic environment to offer quality Education in Electrical Engineering
- To develop and maintain appropriate facilities for promoting research and innovation for sustainable development
- To develop overall personality of students by instilling in them social responsibility and leadership qualities

Programme Educational Objectives (PEOs)

The Program Educational Objectives (PEOs) for the **Electrical Engineering** program describe accomplishments that graduates are expected to attain within five to seven years after graduation

PEO – 1: To provide students with strong fundamentals concepts and also advanced tools and techniques to enable the graduates build solutions or systems of varying complexity.

PEO – 2: To enable graduates to pursue research, have a successful career in academia or industries associated with Electrical Engineering

PEO – 3: To prepare students as entrepreneurs capable of delivering ethical, innovative and sustainable solutions to the problems identified.

Programme Specific Outcome (PSOs)

After the successful completion of B.E programme in Electrical Engineering, the graduates will be able to

PSO – 1: Analyze and design electrical machines and power converters

PSO – 2: Implement and maintain computerized solutions in Power and Energy sectors.

PSO – 3: Implement AI and Automation to solve problems Industry and Society

PSO – 4: Design and develop Renewable Energy Solutions and Electrified Automobiles

PEO-PO MAPPING

POs PEOs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
PEO 1	3	2	3	3	3	2	1	1	3	2	3	1
PEO 2	3	3	3	3	3	3	2	2	2	3	3	2
PEO 3	1	1	3	1	1	3	3	3	3	1	2	3

III Semester

BCS-301 Mathematics III

Course Outcomes: Upon successful completion of this course, students will be able to:

1. Solve the Fourier Transform of function.
2. Compute poles & zeros.
3. Evaluate the real & complex integrals with the help of Cauchy's Residue Theorem.
4. Utilize curve fitting techniques for data representations and computation in engineering analysis.
5. Use Binomial, Poisson & Normal Distribution to solve statistical problems.

BEE 301 Network Analysis & Synthesis

Course Outcomes: At the end of this course students will demonstrate the ability to

1. Understand basics electrical circuits with nodal and mesh analysis.
2. Appreciate electrical network theorems.
3. Apply Laplace Transform for steady state and transient analysis.
4. Determine different network functions.

BEE 302 Electrical Machines I

Course Outcomes: At the end of this course students will demonstrate the ability to

1. Understand the principle of Electromechanical Conversion of Energy in electrical machines
2. Understand how the DC Generators and DC Motors operate and also their characteristics and applications
3. Apply mathematical models of the machines to design, test and analyze the performance of DC Machines
4. Understand the starting methods and apply their knowledge to control speed of DC Machines and
5. Analyze the performance of single phase and three phase transformers

BEE 303 Solid State Devices & Circuits

Course Outcomes: At the end of the course, students will be able to:

1. Understand the working of switching devices and apply the same in designing complex circuits with fewer devices.
2. Design amplifier and other complex circuits with the help of special semiconductor devices which will further increase real time applications and reduce runaway situations.
3. Apply the mathematical modeling for the electronic devices and circuits in turn helps in improvement in design in terms of size, power requirement and ease of use.
4. Use variety of electronic devices for designing society friendly electronic gadgets used for security and other useful purposes.

BEC 301 Digital Electronics

Course Outcomes: At the end of the course, students will demonstrate the ability to:

1. Understand binary codes, binary arithmetic, minimization techniques and their relevance to digital logic design.
2. Design & analyze modular combinational circuits with MUX/DEMUX, Decoder, Encoder and sequential logic circuits.
3. Understand finite state machines and develop a digital logic to find out sustainable solution of a real life problem.
4. Understand and implement various digital integrated circuits using different logic families and simple systems composed of PLDs.

MC 302/MC 402 Human Values & Professional Ethics

Course Outcome: On completion of this course, the students will be able to:

1. Understand the significance of value inputs in a classroom, distinguish between values and skills, understand the need, basic guidelines, content and process of value education, explore the meaning of happiness and prosperity and do a correct appraisal of the current scenario in the society
2. Distinguish between the Self and the Body, understand the meaning of Harmony in the Self the Co-existence of Self and Body.
3. Understand the value of harmonious relationship based on trust, respect and other naturally acceptable feelings in human-human relationships and explore their role in ensuring a harmonious society.
4. Distinguish between ethical and unethical practices, and start working over the strategy to actualize a harmonious environment wherever they work.

BEC 351 Digital Electronics Lab

Course Outcomes: At the end of the course, students will demonstrate the ability to:

1. Implement the basic digital theory concepts practically and will be able to verify various results derived in theory.
2. Design, analyze and troubleshoot broad range of combinational and sequential circuits for various practical problems using basic gates and flip flops I.C's.
3. Develop technical writing skills to communication effectively and present one's own work.
4. Acquire teamwork skills for finding sustainable solution of a complex problem and working effectively in groups.

BEE 352 Electrical Machines Lab – I

Course Outcomes: On successful completion of the course, the student will be able to

CO1 To experiment with the shunt and compound D.C. Generators and obtain their performance characteristics

CO2 To perform load tests on D.C. Motors and analyze their performance characteristics

CO3 To conduct tests on single phase transformers and predict and analyze their performance

BEE 352 Solid State Devices & Circuits Lab

Course Outcomes: At the end of the course, students will be able to:

1. Understand the characteristics of diodes, transistors, JFETs..
2. Understand the operation and characteristics of different configurations of BJT.
3. Design complex electronic circuits with fewer devices.
4. Able to understand the concept and applications of feedback mechanism in electronic circuits.

IV Semester

BEE 401 Electrical Measurements and Instruments

Course Outcomes: At the end of the course, students will demonstrate the ability to:

1. understand the fundamentals & characteristics of measurement & instrumentation.
2. analyze the different types with their applications of sensors and transducer.
3. apply the skills how to use electronic instruments & bridges with their applications.
4. apply the skills how to use display & special devices with their applications.
5. understand the operation, classification & application of telemetry & data acquisition system.

BEC 402 Linear Integrated Circuits

Course Outcomes: At the end of the course, students will demonstrate the ability to:

1. analyze and design analog circuits such as: differential amplifier, Op-amp and current mirror.
2. analyze and develop skill to design circuits such Op-amp circuit as comparator Schmitt trigger precision rectifier peak detector circuit, integrator circuit, difference circuit square wave and triangular wave generator etc.
3. understand the concept of filters & oscillators develop to design various filter and oscillator circuit.
4. know about various type of techniques to develop A/D and D/A convertors.
5. understand the basics of timer IC 555 and phase locked loop, its working concept.

BEE 402 Electrical Machines – II

Course Outcomes: At the end of this course students will demonstrate the ability to

1. Understand the principle of Synchronous Generators and Motors and their characteristics and applications
2. Apply mathematical models of the Synchronous machines to design, test and analyze their performance
3. Understand the operation of three phase Induction motors and analyze their performance.

4. Apply mathematical models of the Single phase induction Motors to test and analyze their performance
5. Aware of the working principle of special AC and DC motors and their applications.

BEE-403 Electromagnetic Theory

Course Outcomes: At the end of this course, student will have the ability to:

1. Understand the concepts of electromagnetic and magneto-statics
2. Understand and apply the time varying fields and Maxwell's equation to enhance various devices performance, hence upgrading its impact on society,
3. Analyse Uniform plane wave, Poynting vector and Flow of power to deign more efficient devices for improving communication capabilities in turn reduce impact of radiations.
4. Understand the basic concepts of transmission line and guided waves and apply them in designing better transmission line in terms of low power losses.

BCS 402 Data structures and Algorithms

Course Outcomes: At the end of this course students will demonstrate the ability to

1. To review the concepts of fundamental data structures to be used in programming. To understand various searching algorithms.
2. To understand the various operations on different types of data structures such as stacks, queues and linked lists. To apply and analyze various data structures on different applications.
3. To understand, analyze and compare various sorting algorithms. To understand the concept of hashing and its techniques.
4. To understand the various types of tree structures and their implementation. To evaluate various tree structures. To be able to apply tree structures on various problems.
5. To understand and implement various types of graphs**.** To study and implement various shortest path algorithms on graphs.

MC 401 Environment and Ecology

Same as CSE and ECE

BEE 451 Electrical Measurements & Instrumentation Lab

Course Outcomes: At the end of the course, students will demonstrate the ability to:

1. apply the skills how to select the correct sensors & transducers to find unknown values.
2. analyze the different types with their characteristics of sensors and transducer.
3. apply the skills how to use electronic instruments with their applications.

4. apply the skills how to use display devices with their applications.

BEC 452 Linear Integrated Circuits Lab

Course Outcomes: At the end of the course, students will demonstrate the ability to:

1. design and implement an inverting and non- inverting amplifier circuit.
2. design and implement a summing amplifier difference amplifier, a differentiator and an integrator circuit.
3. design and implement RC and LC oscillator.
4. know about and design square wave generator to operate at frequency f_o=500H.
5. know about timer-555 operation as monostable and astable multivibrator.

BEE 452 Electrical Machines Lab II

On successful completion of the course, the student will be able to

CO1 To demonstrate some methods of starting and speed control of an Induction Motor

CO2 To operate a synchronous motor and demonstrate the effect of excitation on its performance

CO3 To conduct various tests on an Alternator and analyze the performance

CO4 To conduct various tests on a single phase Induction motor and analyze its performance

BCS 452 Data Structures and Algorithm Lab

Course Outcomes: At the end of the course, students will be able to:

1. Analyze the algorithms to determine the time and computation complexity and justify the correctness.
2. Implement search problem (Linear Search and Binary Search).
3. For a given problem of Stacks, Queues and linked list student will able to implement it and analyze the same to determine the time and computation complexity.
4. Student will able to write an algorithm Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity and will able to implement Graph search and traversal algorithms and determine the time and computation complexity.

V Semester

BEE-501	**Power Systems – I**	**L-T-P-C: 3-0-0-3**
Course Outcomes: At the end of this course students will demonstrate the ability to		
CO1	Understand the concepts of power systems	
CO2	Distinguish between various components of power system	
CO3	To analyse different types of faults, Estimate fault currents, over-voltages and insulation coordination	
CO4	Comprehend basic protection schemes	
CO5	Understand concepts of HVDC power transmission and renewable energy	

	generation

BEE-502	Signals and Systems	L-T-P-C: 2-0-0-2
Course Outcomes: At the end of this course students will demonstrate the ability to		
CO1	Analyse different types of signals	
CO2	Represent continuous and discrete systems in time and frequency domain using different transforms	
CO3	Investigate whether the system is stable	
CO4	Do Sampling and reconstruction of a signal	

BEE-503	Microprocessors and Microcontrollers	L-T-P-C: 3-0-0-3
CO1	1. Recall and apply a basic concept of digital fundamentals to microprocessor based personal computer system and Recall the memory types and understand the interfacing of memory with microprocessor. 2. Understand the internal architecture and organization of 8085 & 8086.	
CO2	1. Apply knowledge and demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target microprocessor and microcontroller. 2. Analyse assembly language programs; select appropriate assemble into machine a cross assembler utility of a microprocessor and microcontroller.	
CO3	Discuss how the different peripherals are interfaced with microprocessor like 8255,8253/54,8237,8279 etc.	
CO4	1. To analyse the concepts of memory interfacing for faster execution of instructions and improves the speed of operations & hence performance of microprocessors. 2.To Understand the basic knowledge of advanced processor and analyse the internal architecture of 80286,80486 and Pentium processor.	
C05	1. Analyse the internal architecture and real time control of 8051. 2. Analyse the internal architecture of ARM Processors.	

HSMC-501 Economics for Industry L-T-P-C: 3-0-0-3 Common to all

Same as ECE/CSE

DEEE 502 Introduction to Power Plant Engineering

Course Outcomes: At the end of this course, the students will:

1. (i) Recall and apply a basic concept of digital fundamentals to microprocessor based personal computer system and Recall the memory types and understand the interfacing of memory with microprocessor. (ii) Understand the internal architecture and organization of 8085 & 8086.
2. (i) Apply knowledge and demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target microprocessor and microcontroller. (ii) Analyze assembly language programs; select appropriate assemble into machine a cross assembler utility of a

microprocessor and microcontroller.

3. Discuss how the different peripherals are interfaced with microprocessor like 8255, 8253/54,8237,8279,etc.
4. (i)To analyze the concepts of memory interfacing for faster execution of instructions and improves the speed of operations & hence performance of microprocessors. (ii) To understand the basic knowledge of advanced processor and Analyze the internal architecture of 80286, 80486 and Pentium processor.
5. (i) Analyze the internal architecture and real time control of 8051. (ii) Analyze the internal architecture of ARM Processors.

OEEE 501 VLSI Circuits

OEEE-501	VLSI Circuits	L-T-P-C: 3-0-0-3
Course Outcomes: At the end of this course students will demonstrate the ability to		
CO1	Comprehend IC Fabrication Techniques	
CO2	Analyse and design MOSFET logic circuits	
CO3	Analyse and design CMOS logic circuits	
CO4	Design Read Only Memory, Random Access Memory	
CO5	Design Adders, multipliers	

BEE 551 Power Systems I Lab

Course Outcomes: At the end of this course students will demonstrate the ability to

1. Calculate the various parameters of transmission lines using MATLAB.
2. Analyze the design of various components of distribution system.

BEE 552 Electronic Design Lab

Course Outcomes: At the end of this course students will demonstrate the ability to

1. Study using MATLAB various Electrical circuits for combinations of R, L, C, and AC or DC sources.
2. Study using MATLAB various Electronic circuits using diode, transistors and OPAMP.

BEE 553 Microprocessor and Microcontrollers Lab

Course Outcomes: At the end of the course, students will demonstrate the ability to:

1. Do basic assembly language programming of 8085.
2. Do advance assembly language programming of 8086.
3. Do basic assembly language programming of 8085 for interfacing of peripherals.
4. Do advance assembly language programming of 8086 for interfacing of peripherals

VI SEMESTER

BEE601 Power Systems II

BEE-601	Power Systems – II	L-T-P-C: 3-1-0-4
Course Outcomes: At the end of this course students will demonstrate the ability to		
CO1	Apply numerical methods to analyse a power system in steady state	
CO2	Comprehend stability constraints in a synchronous grid	
CO3	Understand methods to control the voltage, frequency and power flow	
CO4	Comprehend the monitoring and control of a power system	
CO5	Appreciate the basics of power system economics	

BEE602 Automatic Control Systems

BEE-602	Automatic Control System	L-T-P-C: 3-1-0-4
CO1	Understand concepts of Time Domain and Frequency Domain Analysis	
CO2	Model linear-time-invariant systems using transfer function	
CO3	Model linear-time-invariant systems using state-space representations	
CO4	Apply the concept of stability in linear-time invariant systems	
C05	Design simple feedback controllers	

BEE603 Power Electronics

BEE-603	Power Electronics	L-T-P-C: 3-1-0-4
Course Outcomes: At the end of this course students will demonstrate the ability to		
CO1	Ability to analyse different types of power semiconductor devices and their switching.	
CO2	Demostrate the triggering circuit and snubber circuit, operation of choppers and basic topologies of DC-DC Switching regulators	
CO3	Ability to analyse operation, characteristics and performance parameter of controlled rectifiers	
CO4	Illustrate the operation of AC voltage controller and cyclo- converter and its application.	
C05	Analyse the operation of single phase and three phase inverters with and without PWM techniques and to understand harmonic reduction methods.	

MC601 Occupational Health and Safety

Same as ECE, CSE

DEEE601 Soft Computing

DEEE-601	Soft Computing	L-T-P-C: 3-1-0-4
Course Outcomes: At the end of this course students will demonstrate the ability to		
CO1	Artificial Intelligence, Various types of production systems, characteristics of production systems	
CO2	Neural Networks, architecture, functions and various algorithms involved	
CO3	Fuzzy Logic, Various fuzzy systems and their functions	
CO4	Genetic algorithms, its applications and advances	
C05	The unified and exact mathematical basis as well as the general principles of various soft -computing techniques.	

DEEE 701 **1 Electrical and Hybrid Vehicles**

OEEE-601	Electrical and Hybrid Vehicles	L-T-P-C: 3-0-0-3
Course Outcomes: At the end of this course students will demonstrate the ability to		
CO1	Understand the models used to describe hybrid vehicles and their performance.	
CO2	To comprehend electric and hybrid drive train topologies	
CO3	To realize different possible ways of energy storage	
CO4	Understand the different strategies of energy management	

VI SEMESTER

BEE651 Power Electronics and Drives Lab

Course Outcomes: At the end of this course students will demonstrate the ability to

3. Correlate theoretical and practical analysis of AC-AC, DC-AC converters and also converter fed to AC&DC drives.
4. Analyze the characteristics of MOSFET, SCR and SCR firing circuits

BEE652 Automatic Control Systems Lab

Course Outcomes: At the end of this course students will demonstrate the ability to

1. Demonstrate and analysis various controllers like, PID, Servomotor, synchro transmitter receiver.
2. Study using MATLAB of 1st, 2nd order system, laplace transform, inverse laplace transform, PID, various plots such as Root locus, Nyquist plot, Bode Plot.

BEE653 Power Systems II lab

Course Outcomes: At the end of this course students will demonstrate the ability to

1. Analyze the performance of transmission line and relays.
2. Analyze different types of short circuit faults which occurs in power system.

VII SEMESTER

BEE 701 Digital Signal Processing

BEE-701	Digital Signal Processing	L-T-P-C: 3-0-0-3
Course Outcomes: At the end of this course students will demonstrate the ability to		
CO1	Represent signals mathematically in continuous and discrete-time, and in the frequency domain.	
CO2	Understand the Discrete-Fourier Transform (DFT) and the FFT algorithms	
CO3	Realize Digital filter structures	
CO4	Design digital filters for various applications	
C05	Apply multi-rate digital signal processing for the analysis of real-life signals including image	

BEE 702 Advanced Electrical Drives

BEE-702	Advanced Electrical Drives	L-T-P-C: 2-0-0-2
Course Outcomes: At the end of this course students will demonstrate the ability to		
CO1	To comprehend the fundamentals of Electric Drives	
CO2	To understand the dynamics of Electric Drive	
CO3	To comprehend the dynamics of starting and braking of DC, Three phase	

	Induction and Synchronous motors
CO4	Understand the power electronic converters used for dc motor speed control
CO5	Understand the power electronic converters used for induction motor speed control

BEE 703 Power System Operation and Control

BEE-703	**Power System Operation and Control**	**L-T-P-C: 3-0-0-3**
Course Outcomes: At the end of this course students will demonstrate the ability to		
CO1	Comprehend structure of Power System	
CO2	Understand the economic operation of power system	
CO3	Describe Load Frequency Control methods	
CO4	Explain Automatic Voltage Control methods	
CO5	Understand State Estimation	

DEEE 704 Energy Audit

DEEE-704	**Energy Audit**	**L-T-P-C: 3-1-0-4**
Course Outcomes: At the end of this course students will demonstrate the ability to		
CO1	Understand the Power distribution system planning, operation and maintenance	
CO2	Describe the types of Energy auditing and energy audit instruments.	
CO3	Explain the short and long term measures to reduce loss and improve energy efficiency	
CO4	Understand Demand Side Management	

OEEE 701 Machine Learning and Python Programming

Course Outcomes: At the end of this course students will demonstrate the ability to

CO1.Describe what Data Science is and the skill sets needed to be a data scientist. • Explain in basic terms what Statistical Inference means. Identify probability distributions commonly used as foundations for statistical modeling. Fit a model to data.

CO2. Use R to carry out basic statistical modeling and analysis.

CO3. Explain the significance of exploratory data analysis (EDA) in data science. Apply basic tools (plots, graphs, summary statistics) to carry out EDA.

CO4. Describe the Data Science Process and how its components interact

CO5 Use APIs and other tools to scrap the Web and collect data. And Apply EDA and the Data Science process in a case study.

BEE 751 Digital Signal Processing Lab

Course Outcomes: After performing the experiments of DSP lab, students will be able to,

1. Understand the use of MATLAB as software tool for the implementation of DSP concepts.
2. Visualize the conceptual similarity between the theory and practical implementation.

3. Understand the concepts of basic signal processing concepts such as convolution, correlation, filtering etc.
4. Design the various filters to do various processing on signals.

BEE 752 Internship Assessment

Industrial exposure to students for a period of 30 to 45 days

PROJEE1 Project Stage I

Course Outcomes: At the end of this course students will demonstrate the ability to
Hands on experience in deciding on a project work, collecting literature, finding relevant social / industrial needs and use technological interventions to give appropriate solutions, formulating methodology, working out the solution, analyzing the results and concluding on future prospects

VIII SEMESTER

BEE 801 Industrial Electrical Systems

BEE-801	Industrial Electrical Systems	L-T-P-C: 2-0-0-2
Course Outcomes: At the end of this course students will demonstrate the ability to		
CO1	Understand various components of industrial electrical systems	
CO2	Understand the electrical wiring systems for residentialrepresenting the systems with standard symbols and drawings	
CO3	Analyse and choose the appropriate ratings of various electrical system components.	
CO4	Understand the electrical wiring systems of commercial and industrial consumers, representing the systems with standard symbols and drawings, SLD	
C05	To understand concepts of Automation and PLC SCADA	

DEEE 803 Analog and Digital Communication

DEEE-603	Analog and Digital Communication	L-T-P-C: 3-1-0-4
Course Outcomes: At the end of this course students will demonstrate the ability to		
CO1	Exhibit knowledge of Elements of communication system	
CO2	Understand Phase modulation Techniques	
CO3	Understand Pulse modulation systems	
CO4	Analyse digital modulation Techniques	
C05	Analyse information coding techniques	

OEEC 803 Advance Sensors and Transducers

Course Outcomes: At the end of the course, students will demonstrate the ability to:

1. Apply the mathematical knowledge and science & engineering fundamentals gained to solve problems pertaining to measurement applications.
2. Analyze the problems related to sensors & transducers.
3. Select the appropriate sensor/transducer for a given application.

4. Determine the static and dynamic characteristics of transducers using software packages.
5. Understand fiber optic sensor and applications. Ability to understand smart traducer and its standard.

BHSM 804 Principles of Management

BHSM-804	Principles of Management	L-T-P-C: 3-0-0-3
CO1	Remembering the concept of Management, human relation and skills of management	
CO2	Understand the meaning of planning , strategic management	
CO3	Understand the steps of Decision Making and Technique	
CO4	Remembering of the nature of organisation, motivational technique, leaderships etc.	
C05	Performs and evaluate of budgetary and no budgetary control technique	

BEE 851 Electrical CAD and Fabrication Lab

Course Outcomes: After completion of this lab, students will be able to,

1. get hands on experience of building some small circuits.
2. get familiar with design process of electronic circuits.
3. understand the use of circuit simulation software required for circuit design.

BEE 852 PROJEE 2 Project Stage II

Course Outcomes: At the end of this course students will demonstrate the ability to
Hands on experience in deciding on a project work, collecting literature, finding relevant social / industrial needs and use technological interventions to give appropriate solutions, formulating methodology, working out the solution, analyzing the results and concluding on future prospects

BEE-501	Power Systems – I	L-T-P-C: 3-0-0-3
Course Outcomes: At the end of this course students will demonstrate the ability to		
CO1	Understand the concepts of power systems	
CO2	Distinguish between various components of power system	
CO3	To analyse different types of faults, Estimate fault currents, over-voltages and insulation coordination	
CO4	Comprehend basic protection schemes	
CO5	Understand concepts of HVDC power transmission and renewable energy generation	