

NRI INSTITUTE OF INFORMATION SCIENCE AND TECHNOLOGY, BHOPAL
DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
COURSE OUTCOMES(COs)

Course Outcomes(Cos):

Course outcomes gives the resultant knowledge and skills the student acquires at the end of each course.it defines the cognitive processes a course provides. The course outcomes are framed for the individual faculty after discuss with HOD along with one subject area expert.

Program Name : Bachelor of Technology(B.Tech) G.S (w.e.f 2017)

Branch : Electrical & Electronics Engineering

Course Code	Course Name	Course Outcomes(Cos)
BE-104	Basic Electrical & Electronics Engineering	<p>After Successful completion of course ,student will be able to:</p> <p>CO1: The student shall be able to identify fundamental elements, sources and would be able to apply laws and theorems for solving DC/ AC networks CO2: The learner would acquire the knowhow of magnetic materials and single phase transformer and would be able to reveal its working, testing and use the information for basic problem solving.</p> <p>CO3: The student shall be able to differentiate between various electrical machines and would be able to state correct working and characteristics.</p> <p>CO4: The learner shall be able to identify number systems, digital electronic devices and realize various functions using them</p> <p>CO5: The students shall be able to identify and differentiate diodes, transistors and would be able to appropriately describe their outputs for various</p>
ES301	Energy & Environmental Engineering	<p>After Successful completion of course ,student will be able to:</p> <p>CO1: Identity key challenges and technologies in energy use , utilization of energy resources.</p> <p>CO2: Explain energy conversation and concept of an ecosystem.</p> <p>CO3: Explain biodiversity and its conservation.</p> <p>CO4: Explain various types of environmental pollution.</p> <p>CO5: Explain environment conse-quences and social issues.</p>
EX 302	Signal and System	<p>After Successful completion of course ,student will be able to:</p> <p>CO1: Understand mathematical description and representation of continuous and discrete time signals and systems.</p> <p>CO2: Develop input output relationship for linear shift invariant system and understand the convolution operator for continuous and discrete time system.</p> <p>CO3: Understand and resolve the signals in frequency domain using Fourier series and Fourier transforms.</p> <p>CO4: Understand the limitations of Fourier transform and need for Laplace transform and develop the ability to analyze the system in s- domain.</p> <p>CO5: Understand the basic concept of probability, random variables & random signals and develop the ability to find correlation, CDF, PDF and probability of a given event.</p>

EX 303	Electrical Measurements and Instruments	<p>After Successful completion of course ,student will be able to:</p> <p>CO1: Learn the different types of errors in measurement, calibration process and standards.</p> <p>CO2: Understand the different methods for measurement of various electrical quantities</p> <p>CO3: Familiarize the dynamics of instrument systems</p> <p>CO4: Learn various methods for measurement of non-electrical quantities like temperature, Pressure, Force, Torque, Density, Liquid level, Viscosity, Flow, Displacement etc.</p> <p>CO5: Familiarize various passive and active transducers</p>
EX304	Network Analysis	<p>After Successful completion of course ,student will be able to:</p> <p>CO1:They understand the basic elements of electrical and their analysis with different laws.</p> <p>CO2: They understand the topology of electrical circuit for solving the circuit in easy way.</p> <p>CO3: They understand the time varying analysis of electrical elements.</p> <p>CO4: They understand the frequency varying analysis of electrical elements.</p> <p>CO5: They understand the port analysis with different technology for calculating the parameters.</p>
EX305	Analog Electronics	<p>After Successful completion of course ,student will be able to:</p> <p>CO1:Comply and verify parameters after exciting devices by any stated method.</p> <p>CO2: Implement circuit and test the performance.</p> <p>CO3: Analyze small signal model of FET and MOSFET.</p> <p>CO4: Explain behavior of FET at low frequency.</p> <p>CO5: Design an adjustable voltage regulator circuits.</p>
BT401	Mathematics-III	<p>After Successful completion of course ,student will be able to:</p> <p>CO1: Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits.</p> <p>CO2: Solve problems related to Fourier transform, Z-transform and applications to Communication systems and Signal processing.</p> <p>CO3: Obtain Interpolating polynomials, numerically differentiate and integrate functions ,numerical solutions of differential equations using single step and multi-step iterative methods used in modern scientific computing.</p> <p>CO4: Perform vector differentiation and integration, analyze the vector fields and apply to ElectroMagnetic fields.</p> <p>CO5: Analyze conformal mappings, transformations and perform contour integration of complex functions in the study of electrostatics and signal processing.</p>
EX402	Electrical Machine-I	<p>After Successful completion of course ,student will be able to:</p> <p>CO1:Study stating methods and design starter of DC motor, 3-Ph induction motor and synchronous motor</p> <p>CO2:Analyze the speed-torque characteristics, testing of DC motor, induction motor and alternator andalsodetermine their efficiency.</p> <p>CO3:Study the concepts of single phase induction motor</p> <p>CO4:Understand the working concept of different types of special machines.</p> <p>CO5:Study about Insulators, temperature rise and cooling methods.</p>

EX 403	Digital Electronics Logic Design	<p>After Successful completion of course ,student will be able to:</p> <p>CO1: Use the digital number system</p> <p>CO2: Use the basic logic gates and various reduction techniques of digital logic circuit in detail.</p> <p>CO3: Design combinational and sequential circuits.</p> <p>CO4: Design and implement hardware circuit to test performance and application.</p> <p>CO5: Understand the architecture and use of microcontrollers for basic operations and Simulate using simulation software.</p>
EX 404	Power System-I	<p>After Successful completion of course ,student will be able to:</p> <p>CO1: Ability to design and analyze the real time electrical transmission system with respect to various electrical parameters considering environmental and economic obligations</p> <p>CO2: Develop the ability to implement the appropriate safety equipments for design of electrical power system with enhancing the efficiency of the transmission and distribution system with environment friendly technology.</p> <p>CO3: Ability to implement the knowledge of basic mathematical ,physical and electrical principles to formulate significant electrical hazards</p> <p>CO4: Judge the suitability of installing overhead and underground power transmission strategies considering electrical, mechanical, environmental, performance, safety and economic constraints</p> <p>CO5: Choose the appropriate type of power generating station following norms and guidelines related to cost, environment, societal and ethical issues. Also review the different tariff systems available and determine the one most appropriate for a given scenario to optimize the revenue earned.</p> <p>CO6: Recognize the need to continuously follow the advancements in technology and incorporating them in the present system to improve efficiency</p>
EX405	Control System	<p>After Successful completion of course ,student will be able to:</p> <p>CO1: Determine and use models of physical systems in forms suitable for use in the analysis and design of control systems.</p> <p>CO2: Determine the (absolute) stability of a closed-loop control system.</p> <p>CO3: Perform time domain and frequency domain analysis of control systems required for stability analysis.</p> <p>CO4: Perform time domain and frequency domain correlation analysis.</p> <p>CO5: Apply root-locus, Frequency Plots technique to analyze control systems.</p> <p>CO6: Express and solve system equations in state variable form.</p>
EX501	Electrical Machine-II	<p>After Successful completion of course ,student will be able to:</p> <p>CO1: Understand the working principles of Transformer and Induction Motor.</p> <p>CO2: Calculate the Performance of both transformer and induction motor.</p> <p>CO3: Identify different speed controlling techniques of Induction motor for the given application.</p> <p>CO4: Identify suitable transformer depending on the application of transmission and distribution.</p> <p>CO5: Calculate the load sharing of different transformers in the power engineering.</p>

EX 502	Power Electronics	<p>After Successful completion of course ,student will be able to:</p> <p>CO1: Relate basic semiconductor physics to properties of power devices, and combine circuit mathematics and characteristics of linear and non-linear devices.</p> <p>CO2: Describe basic operation and compare performance of various power semiconductor devices,passive components and switching circuits</p> <p>CO3: Design and Analyze power converter circuits and learn to select suitable power electronic devices by assessing the requirements of application fields.</p> <p>CO4: Formulate and analyze a power electronic design at the system level and assess the performance.</p> <p>CO5: Identify the critical areas in application levels and derive typical alternative solutions, select suitable power converters to control Electrical Motors and other industry grade apparatus.</p> <p>CO6: Recognize the role power electronics play in the improvement of energy usage efficiency and the applications of power electronics in emerging areas.</p>
Departmental Elective EX- 503 (A)	Electrical Power Generation & Economy	<p>After Successful completion of course ,student will be able to:</p> <p>CO1. Demonstrate the knowledge about the electric power generations and their impacts.</p> <p>CO2. Assess the theory and practices of conventional and non-conventional power generation method.</p> <p>CO3. Determine the operation, maintenance and working of power plants.</p> <p>CO4. Determine the operation, maintenance and working of substations</p> <p>CO5. Interpret the practices of various earthing systems</p>
Open Elective EX- 504 (A)	Industrial Electronics	<p>After Successful completion of course ,student will be able to:</p> <p>CO1: Learn about the latest electronic devices available in industry</p> <p>CO2: Be able to effectively provide detailed explanation to the structure and operation of common linear components.</p> <p>CO3: Learn about the digital ICs and sensory electronic devices.Use tools/test equipment to analyze electronic components. Perform basic electronics troubleshooting</p> <p>CO4: Apply critical thinking in solving industrial electronic problems. Perform electronics calculation.Design basic electronic circuits.</p> <p>CO5: Be able to understand the functions of transducer.Gain some experience with operational amplifiers.Learn about industrial control devices</p>
EX-601	Power System-II	<p>After Successful completion of course ,student will be able to:</p> <p>CO1: Exposure to the modeling of individual power system components like transmission lines and generators</p> <p>CO2: Enable the students to do load flow and short circuit calculations</p> <p>CO3: Enable the students to do analysis of economic dispatch of thermal generators , load sharing and governor control</p> <p>CO4: To impart the knowledge of automatic generation control and voltage regulation</p> <p>CO5: To make students capable of analysis of power system stability, security and reliability</p>

EX-602	Microprocessor & Micro-controller	<p>After Successful completion of course ,student will be able to:</p> <p>CO1: Explain the architecture of 8086 with pin diagram and make use of timing diagram to understand memory interfacing</p> <p>CO2: Compare different peripheral interfacing devices like 8255, 8259, 8237, 8251.</p> <p>CO3: Explain architecture of 8051, memory organization, interrupt structures</p> <p>CO4: Develop assembly language programs using addressing modes and instruction set</p> <p>CO5: Design programs using 8096 assembly language</p>
Departmental Elective EX- 603 (B)	Energy Conservation & Management	<p>After Successful completion of course ,student will be able to:</p> <p>CO1: Acquire the knowledge of fundamentals of economic operation of an electrical system.</p> <p>CO2: Acquire the knowledge of basic principles of energy auditing, types and objectives, instruments used</p> <p>CO3: To learn energy efficient control methods and schemes for improvement of starting efficiency in electrical motors.</p> <p>CO4: Understand efficient control strategies, optimal selection, sizing, operation of variable speed drives like pumps and fans.</p> <p>CO5: Acquire the knowledge of analysis of Transformer loading and Feeder loss evaluation methods, scheme for reactive power management, energy efficient illumination system.</p> <p>CO6: Acquire the knowledge of different types and schemes of cogeneration.</p> <p>CO7: To learn the Energy conservation measures and optimal operation methods for electric load like air conditioning, refrigeration, geysers-solar water heaters, compressors, electrolytic process.</p>
Open Elective EX- 604 (A)	Electronic Instrumentation	<p>After Successful completion of course ,student will be able to:</p> <p>CO1: Explain the working of different electromechanical indicating instruments.</p> <p>CO2: Elucidate the concept of several AC bridges for inductance and capacitance</p> <p>CO3: Describe basic working of instrument transformers.</p> <p>CO4: Measure power and energy with the help of wattmeter and energy meter.</p> <p>CO5: Describe the construction and working of various electronic instruments</p>
EX-701	Power System Protection	<p>After Successful completion of course ,student will be able to:</p> <p>CO1: Understand the working of different types of switchgear equipments like circuit breakers and relays.</p> <p>CO2: Design the ratings for fuses according to the requirement</p> <p>CO3: Application of various protection schemes of various power system components like alternators, transformers and bus-bars.</p> <p>CO4: Decision for various methods of protection in power systems.</p> <p>CO5: The course is aimed at students who have been introduced with fundamental knowledge of power system.</p>
Departmental Elective EX- 702 (C)	High Voltage Engineering	<p>After Successful completion of course ,student will be able to:</p> <p>CO1: Acquire the knowledge of necessity and methods of testing various apparatus in power system.</p> <p>CO2: Knowledge of various circuits for generating high voltages for testing various apparatus and their measurement method.</p> <p>CO3: Knowledge of the various reasons of over voltage in power system and protection methods against them</p> <p>CO4: Knowledge of insulation coordination and design of insulation levels of various parts of power system</p>

<p>Open Elective EX- 703 (B)</p>	<p>Energy Audit & Management</p>	<p>After Successful completion of course ,student will be able to: CO1: Students will be able to apply the knowledge of the subject to calculate the efficiency of various thermal utilities. CO2: Students will be able to design suitable energy monitoring system to analyz and optimize the energy consumption in an organization. CO3: Students will be able to improve the thermal efficieny by designing suitable systems for heat recovery and co-generation. CO4: Students will be able to use the energy audit methods learnt to identify the areas deserving tighter control to save energy expenditure. CO5: Students will be able to carry out the cost- benefit analysis of various investment alternatives for meeting the energy needs of the organization. CO6: Students will be able to guide the employees of the organization about the need and the methods of energy conservation.</p>
<p>EX-801</p>	<p>Electrical Drives</p>	<p>After Successful completion of course ,student will be able to: CO1:The knowledge about thyristor controlled drives for different types of DC motor and speed-torque characteristics. CO2: The knowledge about. Motoring action, braking , plugging, dynamic and regenerative braking and problems on chopper fed drives. CO3: The knowledge about variable frequency control,CSI and VSI and its performance. CO4:The knowledge about static control and effect of slip on the performance of induction machine. CO5:The knowledge about self control of synchronous machine, CSI and VSI fed machine and its performance.</p>
<p>Departmental Elective EX- 802 (B)</p>	<p>Special Machine</p>	<p>After Successful completion of course ,student will be able to: CO1:To explain the theory of ideal synchronous machines and, basic machine relation. CO2:Analyze and apply the concept of steady state analysis and electrical transients in polyphase machines. CO3:Examine the starting and running performance of single phase induction motor and revolving field theory. CO4:Make use of various speed control system for AC motors. CO5:Evaluate the basic operation and performance of special machines and can select special machines for different purpose.</p>
<p>Open Elective EX- 803 (B)</p>	<p>Environmental Issues, Policy, Standards & Regulations</p>	<p>After Successful completion of course ,student will be able to: CO1: Understand importance of environmental rules for development of society.Explain sources and effects of air and water pollutants CO2: Explain air pollution sampling and measurement techniques CO3: Explain water sampling and analysis techniques CO4: Explain solid waste management and noise level measurement techniques CO5: Describe solid waste management techniques</p>