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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

## COURSE OUTCOMES

**REGULATION 2013**

**SUB CODE / SUBJECT NAME :HS8151/ COMMUNICATIVE ENGLISH          YEAR / SEM  :  I/I**

| COURSE CODE | COURSE OUTCOMES |
| --- | --- |
| C1O1.1 (CO1) | Define the fundamentals of engineering after learning the rules of English Grammar |
| C1O1.2 (C02) | Read articles of the general kind in magazines and newspapers |
| C1O1.3 (C03) | Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English. |
| C1O1.4 (C04) | Comprehend conversations and short talks delivered in English |
| C1O1.5 (C05) | Write short essays of the general kind and personal letters and e-mails in EnglIsh. |
| C1O1.6 (C06) | Analyze and identify the root for an effective managerial skills through different spoken discourse and excerpts |

**SUB CODE / SUBJECT NAME :MA8151/ ENGINEERING MATHS - I          YEAR / SEM  :  I/I**

| COURSE CODE | COURSE OUTCOMES |
| --- | --- |
| C1O2.1 (CO1) | Use both the limit definition and rules of differentiation to differentiate functions. |
| C1O2.2 (C02) | Apply differentiation to solve maxima and minima problems. |
| C1O2.3 (C03) | Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus. |
| C1O2.4 (C04) | Apply various techniques in solving differential equations. |
| C1O2.5 (C05) | To study how differential equation help to solve real time problems |
| C1O2.6 (C06) | Introduce the concepts of Differentiation and Integration that will   create an ability to deal with Differential Equations and Multiple integrals. |

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**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**SUB CODE / SUBJECT NAME :PH8151/ ENGINEERING PHYSICS**        **YEAR / SEM : I/I**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C1O3.1 (CO1) | To understand the basic concepts of elastic behavior of materials and evaluate the structural stability of beams. |
| C1O3.2 (C02) | To understand the behavior of different oscillatory wave motion and the concept of LASER action, also discuss about the propagation of light in optical fibers, comparing various types of fibers and its applications in Medical and Engineering fields. |
| C1O3.3 (C03) | Remembering functional ideas of thermal physics and compare the thermal conductivity of different materials to meet the specific needs |
| C1O3.4 (C04) | Describe and analyzing the quantum nature of radiation and matter to solve the real time societal and technological problems. |
| C1O3.5 (C05) | To understand the possible crystal structures and to analyze various growth techniques in the view of increasing demand of crystals for various Engineering and Technological applications. |
| C1O3.6 (C06) | To make the students understand the fundamentals of Physics to solve complex engineering problems for benefit of the society |

**SUB CODE / SUBJECT NAME :CY8151/ ENGINEERING CHEMISTRY**        **YEAR / SEM: I/I**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C1O4.1 (CO1) | Analyze boiler troubles with latest technologies and equipments using external and internal treatment methods. |
| C1O4.2 (C02) | It provides basic knowledge in the field of absorption and catalysis. |
| C1O4.3 (C03) | Knowledge of alloys gives an idea about the manufacturing process in various industries |
| C1O4.4 (C04) | Analyze issues related to fuels and their synthesis and able to understand working of IC and diesel engines |
| C1O4.5 (C05) | To understand the principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells |
| C1O4.6 (C06) | The knowledge gained on engineering materials, fuels, energy sources and water treatment techniques will facilitate better understanding of engineering processes and applications for further learning |

**SUB CODE / SUBJECT NAME :GE8151/ PROBLEM SOLVING AND PYTHON PROGRAMMING**
**YEAR / SEM: I/I**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| **C1O5.1 (CO1)** | Develop algorithmic solutions to simple computational problems. |
| **C1O5.2 (C02)** | Demonstrate programs using simple Python statements and expressions. |
| **C1O5.3 (C03)** | Explain control flow and functions concept in Python for solving problems |
| **C1O5.4 (C04)** | Use Python data structures – lists, tuples & dictionaries for representing compound data. |
| **C1O5.5 (C05)** | Explain files, exception, modules and packages in Python for solving problems |
| **C1O5.6 (C06)** | Develop Python programs to illustrate concise and efficient algorithms |

**SUB CODE / SUBJECT NAME :  GE8152/ ENGINEERING GRAPHICS**          **YEAR / SEM: I/I**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| **C1O6.1 (CO1)** | How to draw different engineering curves, draw different orthographic projections. |
| **C1O6.2 (C02)** | Illustrate different views of points, lines and planes inclined to both HP and VP in first quadrant. |
| **C1O6.3 (C03)** | Develop the projections of simple solids inclined to any one plane |
| **C1O6.4 (C04)** | Categorize Section and develop various solids |
| **C1O6.5 (C05)** | Evaluate to Draw 3D projections of simple solids by Perspective by visual ray method and Isometric projections |
| **C1O6.6 (C06)** | Build an engineering component using Paper drawing as well as in CAD |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**SUB CODE / SUBJECT NAME :GE8161/ PROBLEM SOLVING AND PYTHON PROGRAMMING LAB**
**YEAR / SEM: I/I**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C1O7.1 (CO1) | Develop solutions to simple computational problems using Python programs. |
| C1O7.2 (C02) | Solve problems using conditionals and loops in Python. |
| C1O7.3 (C03) | Develop Python programs by defining functions and calling them |
| C1O7.4 (C04) | Use Python lists, tuples and dictionaries for representing compound data. |
| C1O7.5 (C05) | Develop Python programs using files |
| C1O7.6 (C06) | Developing python programming using predefined functions |

**SUB CODE / SUBJECT NAME : BS8161/ PHYSICS AND CHEMISTRY LAB          YEAR / SEM: I/I**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C1O8.1 (CO1) | To apply the physics principles of Thermal physics and Properties of Matter to evaluate properties of materials |
| C1O8.2 (C02) | To understand measurement technique and usage of new instrument in Optics for real time application in Engineering . |
| C1O8.3 (C03) | Apply the knowledge of semiconducting material, to evaluate the band gap of material useful for engineering solutions. |
| C1O8.4 (C04) | Able to analyze the quality of water for domestic and industrial purpose |
| C1O8.5 (C05) | Used to find out the emf for different metallic solutions from which electrode potential is determined |
| C1O8.6 (C06) | To acquire knowledge about the conductivity of acids and bases |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**SUB CODE / SUBJECT NAME :HS8251/ TECHNICAL ENGLISH          YEAR / SEM: I/II**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C110.1 (CO1) | Define the fundamentals of engineering after learning the rules of English Grammar |
| C110.2 (C02) | Read technical text and write area-specific text effortlessly. |
| C110.3 (C03) | Listen and comprehend lectures and talks in their area of specialization successfully. |
| C110.4 (C04) | Speak appropriately and effectively in varied formal and informal contexts. |
| C110.5 (C05) | Write reports and winning job applications |
| C110.6 (C06) | Analyze and identify the root for an effective managerial skills through different spoken discourse and excerpts |

**SUB CODE / SUBJECT NAME :MA8251/ENGINEERINGMATHEMATICS-II          YEAR / SEM: I/II**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C111.1 (CO1) | Introduce the concepts of Eigen value and Eigenvectors which help to find the stability of the systems in engineering |
| C111.2 (C02) | Define and understand the concepts of vector calculus, needed for finding solutions in all engineering discipline problems. |
| C111.3 (C03) | Develop an understanding of the standard techniques of complex variable theory so as to enable the student to apply them with confidence, in application areas such as heat conduction, elasticity, fluid dynamics and flow of the electric current. |
| C111.4 (C04) | Evaluate real integrals by applying concept of complex integration |
| C111.5 (C05) | Understand and apply the knowledge of Laplace Transforms in solving system of linear diffrentialequations. |
| C111.6 (C06) | Introduces fundamental knowledge in mathematics, that is applicable in the Engineering aspects. |

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**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**SUB CODE / SUBJECT NAME :PH8253/ PHYSICS FOR ELECTRONICS ENGINEERING**
**YEAR / SEM: I/II**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C112.1 (CO1) | Gain knowledge on classical and quantum electron theories and energy band structures |
| C112.2 (C02) | Acquire knowledge on basics of semiconductor physics and it's applications in various devices |
| C112.3 (C03) | Get knowledge on magnetic and dielectric properties of materials |
| C112.4 (C04) | Have necessary understanding on the functioning of optical materials for opto electronics |
| C112.5 (C05) | Understand the basics of quantum structures and their applications in spintronics and carbon electronics |
| C112.6 (C06) | To Solve the complex engineering problems by understanding the essential Properties of materials |

**SUB CODE / SUBJECT NAME :BE8252/BASIC CIVIL & MECHANICAL ENGINEERING**
**YEAR / SEM: I/II**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C113.1 (CO1) | Label the basic knowledge on Civil and Mechanical Engineering. |
| C113.2 (C02) | Explain the materials used for the construction of civilized structures. |
| C113.3 (C03) | Make the use of understand the fundamentals of construction of structure. |
| C113.4 (C04) | Classify the component of power plant units and detailed explanation to IC engines their working principles. |
| C113.5 (C05) | Explain the importance of R & AC system. |
| C113.6 (C06) | Plan for the overall applications of Basic Engineering sciences |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**SUB CODE / SUBJECT NAME :EE8251/CIRCUIT THEORY**         **YEAR / SEM: I/II**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| **C114.1 (CO1)** | Define and understanding the basic circuit elements and mesh and nodal analysis |
| **C114.2 (C02)** | Understanding the concepts of network theorems |
| **C114.3 (C03)** | Analyze the phenomenon of resonance and coupled circuits. |
| **C114.4 (C04)** | Evaluate the transient response of AC and DC circuits. |
| **C114.5 (C05)** | Understanding and analyzing the three phase circuits. |
| **C114.6 (C06)** | Understanding the applications of circuit theory |

**SUB CODE / SUBJECT NAME :GE8291/ENVIRONMENTAL SCIENCE & ENGINEERING YEAR / SEM: I/II**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| **C115.1 (CO1)** | To interpret the relationship between living organisms and the environment and to identify the threats to global biodiversity |
| **C115.2 (C02)** | To identify and prevent the problems related to the pollution of air, water, soil, marine, etc |
| **C115.3 (C03)** | To understand the importance of natural resources and to conserve it for future generation |
| **C115.4 (C04)** | To analyze the social issues of the environment to be a part of sustainable development |
| **C115.5 (C05)** | To create awareness and sustainable population growth and know the contribution of information technology in environmental management |
| **C115.6 (C06)** | To study the integrated themes and biodiversity, natural resources, pollution control, waste management for protecting environment from degradation |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**SUB CODE / SUBJECT NAME :GE8261/ENGINEERING PRACTICES LABORATORY**
**YEAR /   SEM: I/II**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C116.1 (CO1) | How to make joints in carpentry |
| C116.2 (C02) | Make use of joints in plumbing |
| C116.3 (C03) | Show the operation of the lathe |
| C116.4 (C04) | Mark the works in sheet metal |
| C116.5 (C05) | Ability to understand joints in welding |
| C116.6 (C06) | Formulate the brief idea of engineering application |

**SUB CODE / SUBJECT NAME :EE8261/ ELECTRIC CIRCUITS LABORATOR  YEAR /   SEM: I/II**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C117.1 (CO1) | Experiment with Kirchhoff's voltage and current laws |
| C117.2 (C02) | Analyze the network theorems (Thevenin, Norton, Superposition and maximum power transfer Theorem). |
| C117.3 (C03) | Explain the function of CRO and measurement of sinusoidal voltage, frequency and power factor. |
| C117.4 (C04) | Evaluate the time constant of series R-C electric circuits by experimentation.. |
| C117.5 (C05) | Design the RLC Circuits and analyze the frequency response. |
| C117.6 (C06) | Determine the two port network parameters |

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**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**COURSE CODE:   C201        MA6351 - TRANSFORM AND PARTIAL DIFFERENTIAL EQUATIONS**

| | |
|---|---|
| **CO**1. | Evaluating the various model of homogeneous and non homogeneous partial differential equations which helps to solve engineering problems. |
| **CO**2. | Determine the Fourier coefficients in the Fourier series expansion of a given function and which play a vital role in analysing various complex problems in engineering. |
| **CO**3. | Analyzing the one dimensional, two dimensional heat equation and one dimensional wave equation by using the concept of Fourier series, which describes the distribution in a given region over time |
| **CO**4 | Determine Fourier transform for a given function and use them to evaluate the definite integrals which helps in analysing the differential equation and also applied in quantum mechanics |
| **CO**5 | Determine Z transforms and standard function and use them to solve the difference equation, which helps to investigate the discrete time signals. |
| **CO**6 | Understanding of the mathematical principles on transforms and partial differential equation would provide them the ability to formulate and solve the physical problems of engineering |

**COURSE CODE:   C202        EE6301 - Digital Logic Circuits**

| | |
|---|---|
| **CO**1. | Study various number systems , simplify the logical expressions using Boolean functions |
| **CO**2. | Study implementation of combinational circuits |
| **CO**3. | Design various synchronous and asynchronous circuits. |
| **CO**4 | Introduce asynchronous sequential circuits and PLCs |
| **CO**5 | Introduce digital simulation for development of application oriented logic circuits. |
| **CO**6 | To obtain knowledge about VHDL. |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE CODE: C203     EE6302 ELECTROMAGNETIC THEORY

| | |
|---|---|
| CO1. | Remembering the basic mathematical concepts related to electromagnetic vector fields. |
| CO2. | Understand and apply the concepts of electrostatics, electrical potential, energy density and their. |
| CO3 | Understand and apply the concepts of magnetostatics, magnetic flux density, scalar and vector potential and its applications. |
| CO4 | Summarize and Examine the concepts of Faraday's law, induced emf & the relation between the fields under time varying situations. |
| CO5 | Apply and Examine the principles of propagation of Electromagnetic waves and poynting vector. |
| CO6. | Summarize and Evaluate the applications of electromagnetic fields. |

### COURSE CODE: C204     GE6351 Environmental Science and Engineering

| | |
|---|---|
| CO1. | Finding and implementing scientific, technological, economic and political solutions to environmental problems. |
| CO2. | Study the interrelationship between living organism and environment |
| CO3. | Appreciate the importance of environment by assessing its impact on the human world; envision the surrounding environment, its functions and its value. |
| CO4. | Study the dynamic processes and understand the features of the earth's interior and surface. |
| CO5. | Study the integrated themes and biodiversity, natural resources, pollution control and waste management |
| CO6. | Understand the principles of ecology and environmental issues that apply to air ,land, and water issues on a global scale |

### COURSE CODE: C205          EC6202 - Electronic Devices and Circuits

| | |
|---|---|
| CO1. | Remember the basic principle and characteristics of PN junction devices. |
| CO2. | Explain the operation and applications of electronic devices. |
| CO3. | Analyze about the different types of amplifiers and configurations |
| CO4. | Develop the Multistage amplifiers and differential amplifier and it types. |
| CO5. | Explain the feedback amplifier, Power amplifier and oscillator |
| CO6. | Design the amplifiers and oscillators with the knowledge of electronic devices |

## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**COURSE CODE: C206      EE6303- Linear Integrated Circuits and Applications**

| CO1 | Explain the procedure for the fabrication of IC |
|---|---|
| CO2 | Understand the DC & AC characteristics of Operational amplifier |
| CO3 | Analyze the applications of Operational amplifier |
| CO4 | Describe the internal functional blocks of special ICs |
| CO5 | Design the internal functional blocks of special ICs |
| C06 | Examine the technology change in linear integrated circuits |

**COURSE CODE: C207      EC6361 Electronics Laboratory**

| CO1. | Explain the characteristics of Semiconductor diode, Zener diode, NPN Transistor under common emitter , common collector and common base configurations |
|---|---|
| CO2 | Explain the characteristics of JFET, UJT and generation of saw tooth waveforms |
| CO3 | Design characteristics of photo diode & photo transistor, Study of light activated relay circuit. |
| CO4 | Design and testing of RC phase shift, LC oscillators |
| CO5 | Analyze the Single Phase half-wave and full wave rectifiers with inductive and capacitive filters |
| CO6 | Design of Astable and Monostable multivibrators |

**COURSE CODE: C208      EE6311 Linear and Digital Integrated Circuits Laboratory**

| CO1 | Recall the concept and characteristics of various operational amplifier circuits and Gates |
|---|---|
| CO2 | Understand the operation & application of operational amplifier and digital circuits |
| CO3 | Apply knowledge about the op-amp and digital circuit in various applications |
| CO4 | Design the circuits using op-amps and digital technique for various applications like adder, subtractor,integrator, differentiator ,counter and shift register |
| CO5 | Implement the linear and digital circuits for various applications |
| CO6 | Discuss the technology change in op-amp and Digital circuit |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**COURSE CODE: C209      NUMERICAL METHODS**

| | |
|---|---|
| **CO1** | Solve root finding problems using several methods and solving system of linear algebraic equations.. |
| **CO2** | Estimate the best fit polynomial for the given tabulated data using the different methods and Determine an interpolating function for data |
| **CO3** | Estimate  single integral and double integral using Numerical Integration |
| **CO4** | Solve Ordinary Differential Equation by different methods. |
| **CO5** | Apply various numerical methods in solving an initial value problem involving an ordinary differential equation and use the techniques, skills and modern engineering tools necessary for engineering practice. |
| **CO6** | Use to solve and give procedures for solving numerically different kinds of problems occurring in engineering and technology |

**COURSE CODE: C210      EE6401 ELECTRICAL MACHINES-I**

| | |
|---|---|
| CO1 | Remembering the basic concepts of magnetic circuit  and properties of magnetic materials |
| CO2 | Understanding the constructional details of transformers and analysing their characteristics. |
| CO3 | Analysing the energy and mmf distribution of magnetic system by applying the concepts of electromechanical energy conversion and deriving the expressions for generated voltage and torque developed in dc machines. |
| CO4 | Understanding the constructional details of DC generators and analysing their characteristics.. |
| CO5 | Understanding the constructional details of DC motors and analysing their characteristics. |
| CO6 | Evaluating all parameters related to dc machines and transformers by applying the theoretical concepts. |

### COURSE CODE: C211  OBJECT ORIENTED PROGRAMMING

| | |
|---|---|
| **CO1** | Illustrate the Object Oriented Concepts |
| **CO2** | Apply the Basic Object Oriented concepts in C++ |
| **CO3** | Explain the advanced programming concepts in C++ |
| **CO4** | Extend the Object Oriented Programming concepts in Java |
| **CO5** | Analyze the Exception handling and Multithreading concepts in Java |
| **CO6** | Create Applications using Object Oriented Concepts |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**COURSE CODE: C212      EE6402  TRANSMISSION AND DISTRIBUTION**

| | |
|---|---|
| **CO1** | Define and classify signals and systems, express signals mathematically, explain Nyquist rate, aliasing and sampling techniques to convert analog to discrete time signals, explain spectral density and quantization and its error |
| CO2 | Apply z transforms and its properties to solve difference equations of discrete time systems, perform convolution, represent the magnitude and phase response of discrete time signals using Discrete Time Fourier Transform |
| CO3 | Find the Discrete Fourier Transform of discrete time signals using direct DFT and FFT, analyze the magnitude and phase representation of the Discrete Fourier Transform of  discrete time signals |
| CO 4 | Design digital IIR and FIR filters and model digital IIR and FIR filters using realization structures |
| CO5 | Discuss about architecture, addressing formats, functional modes of digital signal processors, discuss about commercial digital signal processors |
| CO6 | Solve digital signal processing problems using transforms and its properties |

**COURSE CODE: C214      EE6404 MEASUREMENTS AND INSTRUMENTATION**

| | |
|---|---|
| **CO1** | Understand the Design and working of various types of Electrical and Electronics Instruments. |
| CO2 | Analyse and Apply  the fundamentals of of Electrical and Electronics Instruments. |
| CO3 | Analyse and educate on the comparison between various measurement techniques. |
| CO4 | Understand about the various storage and display devices. |
| CO5 | Design and Assemble the  various transducers and the data acquisition systems. |
| CO6 | Define the working principle of all type of practical Instruments. |

**COURSE CODE: C215     OBJECT ORIENTED PROGRAMMING LAB**

| | |
|---|---|
| **CO1** | Develop simple C++ Programs |
| **CO2** | Implement Object Oriented Concepts |
| **CO3** | Apply advanced object oriented objects |
| **CO4** | Developing File Handling Programs for Sequential and Random access |
| **CO5** | Develop Simple Java Applications |
| **CO6** | Demonstrate threading and Exception handling in java |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**COURSE CODE: C216      EE6411 ELECTRICAL MACHINES LAB-I**

| | |
|---|---|
| CO1 | Estimating the efficiency of DC generators and analyzing their characteristics by experimental load analysis |
| CO2 | Estimating the efficiency of DC motors and analyzing their characteristics by experimental load analysis |
| CO3 | Estimating the efficiency of transformers and analyzing their characteristics by experimental  load analysis |
| CO4 | Estimating the losses, regulation and efficiency  of dc machines  and transformers by indirect loading  through various tests. |
| CO5 | Understanding the operation of various starters of dc motor  and various connections for three phase transformer |
| CO6 | Creating the ability to model D.C  machines  and  transformers for electrical industries |

**COURSE CODE: C301    EE6501 Power System Analysis**

| | |
|---|---|
| **CO1** | Understanding the need for power system planning and operational studies under steady state operating condition. |
| **CO2** | Analyzing the power system by per phase analysis, representation of different components and to construct Ybus and Z bus. |
| **CO3** | Applying numerical methods to solve the power flow problem. |
| **CO4** | Model and analyze the system under balanced fault conditions. |
| **CO5** | Model and analyze the system under unbalanced fault conditions. |
| **CO6** | Formulate swing equation and using numerical to find  the solution, understanding the importance of stability analysis of power system. |

**COURSE CODE: C302    EE6502 - Microprocessors and Microcontrollers**

| | |
|---|---|
| **CO1** | Understanding the basic concepts of microprocessor (8085) & microcontroller (8051) |
| **CO2** | Compare the addressing modes & instruction set of 8085 & 8051. |
| **CO3** | Identify the need & use of Interrupt structure of 8085 & 8051. |
| **CO4** | Develop skill in simple applications with programming in 8085 & 8051 |
| **CO5** | Examine the commonly used peripheral / interfacing with 8085 & 8051 |
| **CO6** | Create the knowledge about applications of 8085 & 8051 |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE CODE: C303  ME6701 – POWER PLANT ENGINEERING

| CO1 | Explaining the concepts of coal based thermal power plants and its functions. |
|---|---|
| CO2 | Understanding the operation of diesel, gas turbine and combined cycle power plants |
| CO3 | Constructing various nuclear power plants and defining its functions |
| CO4 | Elaborate the various renewable energy power plant and compare its functions |
| CO5 | Remembering energy, economic and environmental issues of various power plants |
| CO6 | Analyzing the issues of various power plants |

### COURSE CODE: C304  EE6503 - Power Electronics

| CO1. | Remembering the different types of power semi-conductor devices and understanding thei switching characteristics   . |
|---|---|
| CO2. | Analyzing the operation, characteristics and performance parameters of controlled rectifiers. |
| CO3. | Understanding the operation, switching techniques and analyzing the different types  of DC-DC switching regulators . |
| CO4. | Applying the different modulation techniques in the operation of pulse width modulated inverters. |
| CO5. | Understanding the operation of AC voltage controller and cycloconverters. |
| CO6. | Designing converters based on the different applications. |

### COURSE CODE: C305  EE6504 - Electrical Machines - II

| CO1. | Knowledge, Model and Analyze on Construction and performance of salient and non – salient type synchronous generators. |
|---|---|
| CO2. | Knowledge, Design and Analyze  Principle of operation and performance of synchronous motor |
| CO3. | Summarize Model and Analyze on Construction, principle of operation and performance of induction machines. |
| CO4. | Apply, Model and Analyze on Starting and speed control of three-phase induction motors. |
| CO5. | Knowledge, Model and Analyze on Construction, principle of operation and performance of single phase induction motors and special machines. |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

| CO6. | Apply, Model and Analyze on braking and applications of induction machines |
|------|----------------------------------------------------------------------------|

## COURSE CODE: C306    IC6501 - Control Systems

| CO1. | Understand and remember the use of transfer function models for analysis physical systems and introduce the control system components. |
|------|----------------------------------------------------------------------------------------------------------------------------------------|
| CO2. | Provide adequate knowledge in the time response of systems and steady state error analysis. |
| CO3. | Analyze the basic knowledge in obtaining the open loop and closed–loop frequency responses of systems. |
| CO4. | Evaluate the stability analysis and design of compensators. |
| CO5. | Create and introduce state variable representation of physical systems and study the effect of state feedback. |
| CO6. | Understand and discuss about the relative stability and nonlinear control system. |

## COURSE CODE: C307    IC6501 – Control and Instrumentation Laboratory

| CO1. | Recall the concept of design of control system. |
|------|-------------------------------------------------|
| CO2. | Understand the concept of Instrumentation and Control design. |
| CO3. | Analyze the basics of Instrumentation and Control system design. |
| CO4. | Evaluate the values of control system and Instrumentation. |
| CO5. | Create the MATLAB simulation of control analysis |
| CO6. | Evaluate the values of process control systems. |

**COURSE CODE: C308    GE6563 Communication Skills - Laboratory**

| | |
|---|---|
| **CO1.** | Provide opportunities to learners to practice their communicative skills to make them become proficient users of English. |
| **CO2.** | Enable learners to fine-tune their linguistic skills (lsrw) with the help of technology to communicate globally. |
| **CO3.** | Enhance the performance of learners at placement interviews and group discussions and other recruitment procedures. |
| **CO4.** | English for national and international examinations and placements |
| **CO5.** | interview skills |
| **CO6.** | soft skills |

**COURSE CODE: C309    EE6512 ELECTRICAL MACHINES LAB-II**

| | |
|---|---|
| **CO1.** | Expose the students to the operation of synchronous machines and induction motors and give them experimental skill |
| **CO2.** | practical understanding about three phase alternator |
| **CO3.** | practical understanding about three phase induction motor |
| **CO4.** | Hands on experiment to understand the working principle of three phase synchronous motor |
| **CO5.** | Understanding the operation of single phase induction motor using various test. |
| **CO6.** | Expose the students to the operation of induction motors and give them experimental skill. |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE CODE: C310    EC6651 COMMUNICATION ENGINEERING

| CO1. | Introduce different methods of analog communication and their significance |
|------|------------------------------------------------------------------------------|
| CO2. | Introduce Digital Communication methods for high bit rate transmission |
| CO3. | Introduce the concepts of source and line coding techniques for enhancing rating of transmission of minimizing the errors in transmission. |
| CO4. | Introduce MAC used in communication systems for enhancing the number of users. |
| CO5. | Introduce various media for digital communication. |
| CO6. | SATELLITE, OPTICAL FIBER – POWERLINE, SCADA |

### COURSE CODE: C311    EC6601 SOLID STATE DRIVES

| CO1 | Understanding the steady state operation, transient dynamics and four quadrant operation of a motor load system. |
|-----|-------------------------------------------------------------------------------------------------------------------|
| CO2 | Analyzing continuous and discontinuous mode operation of the rectifier and chopper fed separately excited dc motor. |
| CO3 | Applying and comparing the stator and rotor speed control methods and closed loop speed control of Induction motor drives. |
| CO4 | Understanding the operation of permanent magnet synchronous motor and self and separate speed control methods of Synchronous motor drives |
| CO5 | Designing the current and speed controllers for a closed loop solid state DC motor drive. |
| CO6 | Designing the DC and AC motor drive by applying different speed control methods. |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**COURSE CODE: C312    EE6602 EMBEDDED SYSTEMS**

| | |
|---|---|
| **CO1** | Introduce the Building Blocks of Embedded System |
| **CO2** | Educate in Various Embedded Development Strategies |
| **CO3** | Introduce Bus Communication in processors, Input/output interfacing. |
| **CO4** | Impart knowledge in Various processor scheduling algorithms. |
| **CO5** | introduce Basics of Real time operating system and example tutorials to discuss on one real- time operating system tool |
| **CO6** | To understand and analyze, linear and digital electronic circuits |

**COURSE CODE: C313 EE6603 POWER SYSTEM OPERATION AND CONTROL**

| | |
|---|---|
| **CO1** | Remembering the basic principles of power system. |
| **CO2** | Understanding of operational constraints (equipment and stability), control objectives and their implementation. |
| **CO3** | Applying the basic power system fundamentals to gain knowledge about the power system operation and control |
| **CO4** | Analyzing the operation and control of power system. |
| **CO5** | Evaluating the performance of operation and control of power system. |
| **CO6** | Understand and discuss about the function of SCADA. |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE CODE: C314    EE6604 DESIGN OF ELECTRICAL MACHINES

| | |
|---|---|
| CO1 | Students will be able to **choose** the electrical engineering & insulating materials and solve the thermal design problem by applying the standard specifications |
| CO2 | Students will be able to **interpret** the design problems the area of D.C. machines and performance prediction by applying the standard design procedures |
| CO3 | Students will be able to **select** the design problems in the area of Transformers and solve the design problem by applying the standard design procedures |
| CO4 | Students will be able to **simplify** the design problems in the area of Induction machines and solve the design problem by applying the standard design procedures |
| CO5 | Students will be able to **evaluate** the design problems in the area of synchronous machines and solve the design problem by applying the standard design procedures |
| CO6 | Students will be able to **develop** appropriate transformer and stand by generators also the preparation of layout and estimation distribution system and installation of special equipments |

### COURSE CODE: C315   EE6002 POWER SYSTEM TRANSIENT

| | |
|---|---|
| CO1 | Remembering the basics of Transients in AC circuits and Understanding their types and effects on power systems |
| CO2 | Understanding the generation of Switching transients and Applying the procedure to control them using circuits |
| CO3 | Understanding the mechanism of lightning strokes and production of lightning surges |
| CO4 | Understanding the concepts of Travelling waves on transmission lines and Analyze by computing transients |
| CO5 | Analyze the the impact of voltage transients caused by faults, circuit breaker action, load rejection on integrated power system |
| CO6 | Understanding the importance of study of transients in system planning. |

### COURSE CODE: C316   EE6611 Power Electronics and Drives Laboratory

| | |
|---|---|
| CO1 | Experimenting with the characteristics of semiconductor devices. |
| CO2 | Designing the R,RC and UJT firing circuit. |
| CO3 | Designing the rectifier and comparing with simulation results. |
| CO4 | Designing the buck boost chopper and comparing with simulation results. |
| CO5 | Experimenting with single and three phase pulse width modulated inverters and AC voltage controller. |
| CO6 | Ability to design any power electronic converter and comparing with simulation results. |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**COURSE CODE: C317   EE6612 Microprocessor and Microcontroller Laboratory**

| | |
|---|---|
| CO1 | Recalling the terms and basic concepts for programming using Instruction set of microprocessors and microcontroller |
| CO2 | Illustrate programming strategies and select proper mnemonics and run their program |
| CO3 | Make use of different I/O interfacing with 8085 & 8051 |
| CO4 | Develop assembly language programs for various applications using 8051 microcontroller |
| CO5 | Analyze the operations of 8085 & 8051 under different cases. |
| CO6 | Ability to interact effectively on a social and interpersonal level with fellow students |

**COURSE CODE: C318**
**EE6613 PRESENTATION SKILLS AND TECHNICAL SEMINAR**

| | |
|---|---|
| **CO1** | Supporting the students to study advanced engineering developments |
| **CO2** | Analysing technical reports. |
| **CO3** | Plan to use various teaching aids such as over head projectors, power point presentation and demonstrative models. |
| **CO4** | Improving communication skills |
| **CO5** | Improving soft skills |
| **CO6** | Improving interpersonal skills |

**COURSE CODE: C401**
**EE6701 HIGH VOLTAGE ENGINEERING**

| | |
|---|---|
| CO1 | Identify the causes of overvoltages and its effect on power system |
| CO2 | Explain the breakdown mechanism of solid ,liquid and gaseous dielectrics. |
| CO3 | Discuss the generation of high voltages and high currents |
| CO4 | Measure the high voltages and high currents using appropriate methods |
| CO5 | Test the insulators, circuit breakers ,busing ,isolators and transformers |
| CO6 | Outline the insulation coordination and explain the triggering of impulse generators |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**COURSE CODE: C402**
**EE6702 PROTECTION AND SWITCHGEAR**

| CO1 | Understanding the causes and effects of faults in power system. |
|---|---|
| CO2 | Explain the operating principle and characteristics of Electromagnetic Relay. |
| CO3 | Identify the various faults that can occur on alternator, transformer ,motor ,bus bar and transmission line and select the suitable protection schemes. |
| CO4 | Illustrate the static relays using comparators and analyze the numerical relays. |
| CO5 | Analyze the interruption of capacitive current and compare the various types of circuit breakers . |
| CO6 | Analyze the zones of protection and also essential qualities of protection . |

**COURSE CODE: C403**
**EE6703  SPECIAL ELECTRICAL MACHINES**

| CO1 | Illustrate the construction, Principle of operation and applications of synchronous reluctance motors |
|---|---|
| CO2 | Impart knowledge on the Construction, principle of operation, control and performance of stepping motors |
| CO3 | Explain the Construction, principle of operation, control and performance of switched reluctance motors. |
| CO4 | Disseminate **the** knowledge on the Construction, principle of operation, control and performance of permanent magnet brushless D.C. motors |
| CO5 | Examine the Construction, principle of operation and performance of permanent magnet synchronous motors |
| CO6 | Ability to  analyze different special electrical machines |

**COURSE CODE: C404**
**MG6851  PRINCIPLES OF MANAGEMENT**

| CO1 | To explain the importance of the functions of management in any organization. |
|---|---|
| CO2 | To describe the performance appraisal techniques of employees. |
| CO3 | To give the outline of the different types of organizations |
| CO4 | To analyze the various motivation and leadership theories in detail. |
| CO5 | To describe he types of control , the various techniques of controlling prevailing in the organizations |
| CO6 | To understand the reality to become an entrepreneur. |

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**COURSE CODE: C405**
**EE6004 FACTS**

| CO1 | To understand the concept of flexible AC transmission and the associated problems. |
|-----|----|
| CO2 | To impart knowledge on the concepts of static devices for series and shunt control. |
| CO3 | To study the operation of controllers for enhancing the transmission capability. |
| CO4 | To enhance the transmission capability of transmission system by shunt and series compensation using static controllers. |
| CO5 | To understand the applications of flexible AC transmission systems devices |
| CO6 | To study the interaction of various FACTS devices. |

**COURSE CODE: C406**
**EE6008  MICROCONTROLLER BASED SYSTEM DESIGN**

| CO1 | Understanding the basic concepts and  principle of microcontroller |
|-----|----|
| CO2 | To educate on the use of interrupts and timers |
| CO3 | Examine the commonly used peripheral / interfacing with PIC microcontroller |
| CO4 | Understanding the basic concepts and  principle of ARM Processor |
| CO5 | To analyze and apply computing platform and software for engineering problems. To develop ethical issues, environmental |
| CO6 | impact and acquire management skills. |

**COURSE CODE: C407**
**EE6711 POWER SYSTEM SIMULATION LABORATORY**

| CO1 | Provide better understanding of power system analysis through digital simulation |
|---|---|
| CO2 | Students will be able to investigate the state of a power system of any size and be in a position to analyze a practical system both under steady state and fault conditions. |
| CO3 | To enable the students gain a fair knowledge on the programming and simulation of power systems. |
| CO4 | Acquire skills of using computer packages matlab coding and simulink in power system studies. |
| CO5 | Acquire skills of using mi power software for power system studies. |
| CO6 | Analyze the power system data for load-flow and studies. |

**COURSE CODE: C408**
**EE6712 COMPREHENSION**

| CO1 | Discussing various number systems , simplify the logical expressions using Boolean functions |
|---|---|
| CO2 | Analysing implementation of combinational circuits |
| CO3 | Designing various synchronous and asynchronous circuits. |
| CO4 | Identify asynchronous sequential circuits |
| CO5 | Developing an opportunity to implement the PLD based designs |
| CO6 | Designing digital simulation for development of application oriented logic circuits. |

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**COURSE CODE: C409**
**EE6801  ELECTRIC ENERGY GENERATION,UTILIZATION AND CONSERVATION**

| | |
|---|---|
| **CO1** | Evaluate the traction effort of train & specific energy consumption, choosing and applying motors for train, list the systems of electrification, track equipment and collection gear |
| **CO2** | Classify the light source, design the illumination for indoor lighting & outdoor lighting, Relate the energy saving concept in lamps |
| **CO3** | Illustrate and compare the different methods of electric heating and welding and its advantages |
| **CO4** | Estimate average solar radiation and illustrate the basic principles and performance analysis of collectors in the conversion of solar radiation into heat. |
| **CO5** | Illustrate the basic principle, types and components of  WECS, and to analyse and study the performance of wind |
| **CO6** | Interpret the concept of utilization of electrical energy and to conserve the electrical power |

**COURSE CODE: C410**
**EE6009 POWER ELECTRONICS FOR RENEWABLE ENERGY SYSTEMS**

| | |
|---|---|
| **CO1** | Remembering the  knowledge about the stand alone and grid connected renewable energy systems. |
| **CO2** | Designing of electrical machines for renewable energy applications. |
| **CO3** | Analysing  and comprehend the various operating modes of wind electrical generators and solar energy systems. |
| **CO4** | Designing different power electronic converters for renewable energy systems. |
| **CO5** | Developing the  maximum power point tracking algorithms for  renewable energy systems. |
| **CO6** | Applying optimization techniques to extract maximum from the renewable energy |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

## COURSE CODE: C411 PROFESSIONAL ETHICS IN ENGINEERING

| | |
|---|---|
| **CO1** | Elaborate the basic concepts of ethics and human values & Students also gain the knowledge how to ethically behave in environment. |
| **CO2** | Make use of duties and rights towards the society in an engineering profession and to make proper decision in case of dilemmas. |
| **CO3** | Assess all necessary precautions while conducting experiments and each should take responsible for the experiments conducting in society.. |
| **CO4** | Examine the importance of risk evacuation system in reality and takes the attmost responsibility while handling the risky situations. |
| **CO5** | Plan them to lead a professional life as better expert witnesses and advisors. |
| **CO6** | Support the students with moral values in rights,duties, manufacturing ,design aspects and know the importance of risk and safety |

## COURSE CODE: C412 EE6811 PROJECT WORK

| | |
|---|---|
| **CO1** | Distinguish social, health, technical related issues and provide solution in engineering view. |
| **CO2** | Applying the knowledge to analyze root cause for typical problems and provide possible optimal solution. |
| **CO3** | Ability in identifying the engineering problems and utilize adequate survey to achieve successful solution. |
| **CO4** | Design the mathematical model and simulation model for the technical problems and adaptation with modern engineering tools. |
| **CO5** | Function as a member or team leader to co- ordinate among team members for conclude and summarize the solution. |
| **CO6** | Design and fabricate the model or product with optimum cost to the identified technical issues. |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

## REGULATION 2017

**SUB CODE / SUBJECT NAME: HS8151/ COMMUNICATIVE ENGLISH**  **YEAR / SEM: I/I**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C1O1.1 (CO1) | Define the fundamentals of engineering after learning the rules of English Grammar |
| C1O1.2 (C02) | Read articles of the general kind in magazines and newspapers |
| C1O1.3 (C03) | Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English. |
| C1O1.4 (C04) | Comprehend conversations and short talks delivered in English |
| C1O1.5 (C05) | Write short essays of the general kind and personal letters and e-mails in EnglIsh. |
| C1O1.6 (C06) | Analyze and identify the root for an effective managerial skills through different spoken discourse and excerpts |

**SUB CODE / SUBJECT NAME: MA8151/ ENGINEERING MATHS - I**  **YEAR / SEM : I/I**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C1O2.1 (CO1) | Use both the limit definition and rules of differentiation to differentiate functions. |
| C1O2.2 (C02) | Apply differentiation to solve maxima and minima problems. |
| C1O2.3 (C03) | Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus. |
| C1O2.4 (C04) | Apply various techniques in solving differential equations. |
| C1O2.5 (C05) | To study how differential equation help to solve real time problems |
| C1O2.6 (C06) | Introduce the concepts of Differentiation and Integration that will create an ability to deal with Differential Equations and Multiple integrals. |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**SUB CODE / SUBJECT NAME :PH8151/ ENGINEERING PHYSICS          YEAR / SEM  :  I/I**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C1O3.1 (CO1) | To understand the basic concepts of elastic behavior of materials and evaluate the structural stability of beams. |
| C1O3.2 (C02) | To understand the behavior of different oscillatory wave motion  and the concept of LASER action, also  discuss about  the propagation of light in optical fibers, comparing  various types of fibers and its applications in Medical and Engineering fields. |
| C1O3.3 (C03) | Remembering functional ideas of thermal physics and compare the thermal conductivity of different materials to meet the specific needs |
| C1O3.4 (C04) | Describe and analyzing the quantum nature of radiation and matter to solve the real time societal and technological problems. |
| C1O3.5 (C05) | To understand the possible crystal structures and to analyze various growth techniques in the view of increasing demand of crystals for various Engineering and Technological applications. |
| C1O3.6 (C06) | To make the students understand the fundamentals of Physics to solve complex engineering problems for benefit of the society |

**SUB CODE / SUBJECT NAME :CY8151/ ENGINEERING CHEMISTRY          YEAR / SEM: I/I**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C1O4.1 (CO1) | Analyze boiler troubles with latest technologies and  equipments using external and internal treatment methods. |
| C1O4.2 (C02) | It provides basic knowledge in the field of absorption and catalysis. |
| C1O4.3 (C03) | Knowledge of alloys gives an idea about the manufacturing process in various industries |
| C1O4.4 (C04) | Analyze issues related to fuels and their synthesis and able to understand working of IC and diesel engines |
| C1O4.5 (C05) | To understand the principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells |
| C1O4.6 (C06) | The knowledge gained on engineering materials, fuels, energy sources and water treatment techniques will facilitate better understanding of engineering processes and applications for further learning |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**SUB CODE / SUBJECT NAME :GE8151/ PROBLEM SOLVING AND PYTHON PROGRAMMING**
**YEAR / SEM: I/I**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C1O5.1 (CO1) | Develop algorithmic solutions to simple computational problems. |
| C1O5.2 (C02) | Demonstrate programs using simple Python statements and expressions. |
| C1O5.3 (C03) | Explain control flow and functions concept in Python for solving problems |
| C1O5.4 (C04) | Use Python data structures – lists, tuples & dictionaries for representing compound data. |
| C1O5.5 (C05) | Explain files, exception, modules and packages in Python for solving problems |
| C1O5.6 (C06) | Develop Python programs to illustrate concise and efficient algorithms |

**SUB CODE / SUBJECT NAME :  GE8152/ ENGINEERING GRAPHICS**        **YEAR / SEM: I/I**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C1O6.1 (CO1) | How to draw different engineering curves, draw different orthographic projections. |
| C1O6.2 (C02) | Illustrate different views of points, lines and planes inclined to both HP and VP in first quadrant. |
| C1O6.3 (C03) | Develop the projections of simple solids inclined to any one plane |
| C1O6.4 (C04) | Categorize Section and develop various solids |
| C1O6.5 (C05) | Evaluate to Draw 3D projections of simple solids by Perspective by visual ray method and Isometric projections |
| C1O6.6 (C06) | Build an engineering component using Paper drawing as well as in CAD |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**SUB CODE / SUBJECT NAME: GE8161/ PROBLEM SOLVING AND PYTHON PROGRAMMING LAB**
**YEAR / SEM: I/I**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C1O7.1 (CO1) | Develop solutions to simple computational problems using Python programs. |
| C1O7.2 (C02) | Solve problems using conditionals and loops in Python. |
| C1O7.3 (C03) | Develop Python programs by defining functions and calling them |
| C1O7.4 (C04) | Use Python lists, tuples and dictionaries for representing compound data. |
| C1O7.5 (C05) | Develop Python programs using files |
| C1O7.6 (C06) | Developing python programming using predefined functions |

**SUB CODE / SUBJECT NAME : BS8161/ PHYSICS AND CHEMISTRY LAB          YEAR / SEM: I/I**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C1O8.1 (CO1) | To apply the physics principles of Thermal physics and Properties of Matter to evaluate properties of materials |
| C1O8.2 (C02) | To understand measurement technique and usage of new instrument in Optics for real time application in Engineering . |
| C1O8.3 (C03) | Apply the knowledge of semiconducting material, to evaluate the band gap of material useful for engineering solutions. |
| C1O8.4 (C04) | Able to analyze the quality of water for domestic and industrial purpose |
| C1O8.5 (C05) | Used to find out the emf for different metallic solutions from which electrode potential is determined |
| C1O8.6 (C06) | To acquire knowledge about the conductivity of acids and bases |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**SUB CODE / SUBJECT NAME :HS8251/ TECHNICAL ENGLISH          YEAR / SEM: I/II**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C110.1 (CO1) | Define the fundamentals of engineering after learning the rules of English Grammar |
| C110.2 (C02) | Read technical text and write area-specific text effortlessly. |
| C110.3 (C03) | Listen and comprehend lectures and talks in their area of specialization successfully. |
| C110.4 (C04) | Speak appropriately and effectively in varied formal and informal contexts. |
| C110.5 (C05) | Write reports and winning job applications |
| C110.6 (C06) | Analyze and identify the root for an effective managerial skills through different spoken discourse and excerpts |

**SUB CODE / SUBJECT NAME :MA8251/ENGINEERINGMATHEMATICS-II          YEAR / SEM: I/II**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C111.1 (CO1) | Introduce the concepts of Eigen value and Eigenvectors which help to find the stability of the systems in engineering |
| C111.2 (C02) | Define and understand the concepts of vector calculus, needed for finding solutions in all engineering discipline problems. |
| C111.3 (C03) | Develop an understanding of the standard techniques of complex variable theory so as to enable the student to apply them with confidence, in application areas such as heat conduction, elasticity, fluid dynamics and flow of the electric current. |
| C111.4 (C04) | Evaluate real integrals by applying concept of complex integration |
| C111.5 (C05) | Understand and apply the knowledge of Laplace Transforms in solving system of linear diffrentialequations. |
| C111.6 (C06) | Introduces fundamental knowledge in mathematics, that is applicable in the Engineering aspects. |

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**SUB CODE / SUBJECT NAME :PH8253/ PHYSICS FOR ELECTRONICS ENGINEERING**
**YEAR / SEM: I/II**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C112.1 (CO1) | Gain knowledge on classical and quantum electron theories and energy band structures |
| C112.2 (C02) | Acquire knowledge on basics of semiconductor physics and it's applications in various devices |
| C112.3 (C03) | Get knowledge on magnetic and dielectric properties of materials |
| C112.4 (C04) | Have necessary understanding on the functioning of optical materials for opto electronics |
| C112.5 (C05) | Understand the basics of quantum structures and their applications in spintronics and carbon electronics |
| C112.6 (C06) | To Solve the complex engineering problems by understanding the essential Properties of materials |

**SUB CODE / SUBJECT NAME :BE8252/BASIC CIVIL & MECHANICAL ENGINEERING**
**YEAR / SEM: I/II**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C113.1 (CO1) | Label the basic knowledge on Civil and Mechanical Engineering. |
| C113.2 (C02) | Explain the materials used for the construction of civilized structures. |
| C113.3 (C03) | Make the use of understand the fundamentals of construction of structure. |
| C113.4 (C04) | Classify the component of power plant units and detailed explanation to IC engines their working principles. |
| C113.5 (C05) | Explain the importance of R & AC system. |
| C113.6 (C06) | Plan for the overall applications of Basic Engineering sciences |

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**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**SUB CODE / SUBJECT NAME : EE8251/CIRCUIT THEORY          YEAR / SEM: I/II**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C114.1 (CO1) | Define and understanding the basic circuit elements and mesh and nodal analysis |
| C114.2 (C02) | Understanding the concepts of network theorems |
| C114.3 (C03) | Analyze the phenomenon of resonance and coupled circuits. |
| C114.4 (C04) | Evaluate the transient response of AC and DC circuits. |
| C114.5 (C05) | Understanding and analyzing the three phase circuits. |
| C114.6 (C06) | Understanding the applications of circuit theory |

**SUB CODE / SUBJECT NAME :GE8291/ENVIRONMENTAL SCIENCE & ENGINEERING
YEAR / SEM: I/II**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C115.1 (CO1) | To interpret the relationship between living organisms and the environment and to identify the threats to global biodiversity |
| C115.2 (C02) | To identify and prevent the problems related to the pollution of air, water, soil, marine, etc |
| C115.3 (C03) | To understand the importance of natural resources and to conserve it for future generation |
| C115.4 (C04) | To analyze the social issues of the environment to be a part of sustainable development |
| C115.5 (C05) | To create awareness and sustainable population growth and know the contribution of information technology in environmental management |
| C115.6 (C06) | To study the integrated themes and biodiversity, natural resources, pollution control, waste management for protecting environment from degradation |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**SUB CODE / SUBJECT NAME :GE8261/ENGINEERING PRACTICES LABORATORY**
**YEAR /   SEM: I/II**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C116.1 (CO1) | How to make joints in carpentry |
| C116.2 (C02) | Make use of joints in plumbing |
| C116.3 (C03) | Show the operation of the lathe |
| C116.4 (C04) | Mark the works in sheet metal |
| C116.5 (C05) | Ability to understand joints in welding |
| C116.6 (C06) | Formulate the brief idea of engineering application |

**SUB CODE / SUBJECT NAME :EE8261/ ELECTRIC CIRCUITS LABORATORY**
**YEAR /   SEM: I/II**

| COURSE CODE | COURSE OUTCOMES |
|---|---|
| C117.1 (CO1) | Experiment with Kirchhoff's voltage and current laws |
| C117.2 (C02) | Analyze the network theorems (Thevenin, Norton, Superposition and maximum power transfer Theorem). |
| C117.3 (C03) | Explain the function of CRO and measurement of sinusoidal voltage, frequency and power factor. |
| C117.4 (C04) | Evaluate the time constant of series R-C electric circuits by experimentation.. |
| C117.5 (C05) | Design the RLC Circuits and analyze the frequency response. |
| C117.6 (C06) | Determine the two port network parameters |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**COURSE CODE:  C201**
**MA8353 - TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS**

| | |
|---|---|
| **CO**1 | Understand how to solve the given standard partial differential equations |
| **CO**2 | Solve differential equations using Fourier series analysis which plays a vital role in engineering applications |
| **CO**3 | Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations |
| **CO**4 | Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering |
| **CO**5 | Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems |

**COURSE CODE:  C202**                                   **EE8351 - Digital Logic Circuits**

| | |
|---|---|
| **CO**1 | Ability to design combinational and sequential Circuits. |
| **CO**2 | Ability to study various number systems and simplify the logical expressions using Boolean functions |
| **CO**3 | Ability to design various synchronous and asynchronous circuits. |
| **CO**4 | Ability to introduce asynchronous sequential circuits and PLDs |
| **CO**5 | Ability to introduce digital simulation for development of application oriented logic circuits |

**COURSE CODE: C203**                                   **EE8391 ELECTROMAGNETIC THEORY**

| | |
|---|---|
| **CO1** | Remembering the basic mathematical concepts related to electromagnetic vector fields. |
| **CO2** | Understand and apply  the concepts of electrostatics, electrical potential, energy density and applications. |
| **CO3** | Understand and apply the concepts of magnetostatics, magnetic flux density, scalar and vector potential and its applications. |
| **CO4** | Summarize and Examine the concepts of Faraday's law, induced emf & the relation fields under time varying situations. |
| **CO5** | Apply and Examine the  principles of propagation of Electromagnetic waves and poynting vector. |

**COURSE CODE: C204**          **EE8301 ELECTRICAL MACHINES- I**

| | |
|---|---|
| CO1. | Ability to analyze the magnetic-circuits. |
| CO2. | Ability to acquire the knowledge in constructional details of transformers. |
| CO3. | Ability to understand the concepts of electromechanical energy conversion |
| CO4. | Ability to acquire the knowledge in working principles of DC Generator |
| CO5. | Ability to acquire the knowledge in working principles and various losses occur in Motor |

**COURSE CODE: C205**          **EC8353 - Electron Devices and Circuits**

| | |
|---|---|
| CO1. | Understand the structure of basic electronic devices. |
| CO2. | Be exposed to active and passive circuit elements. |
| CO3 | Familiarize the operation and applications of Transistor like BJT and FET. |
| CO4 | Explore the characteristics of amplifier gain and frequency response. |
| CO5 | Learn the required functionality of positive and negative feedback systems. |

**COURSE CODE: C206**          **ME8792 POWER PLANT ENGINEERING**

| | |
|---|---|
| CO1 | Explaining the concepts of coal based thermal power plants and its functions. |
| CO2 | Understanding the operation of diesel, gas turbine and combined cycle power plants |
| CO3 | Constructing various nuclear power plants and defining its functions |
| CO4 | Elaborate the various renewable energy power plant and compare its functions |
| CO5 | Remembering energy, economic and environmental issues of various power plants |
| CO6 | Analyzing the  issues of various power plants |

## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**COURSE CODE: C207     EC8311 Electronics Laboratory**

| | |
|---|---|
| **CO1**. | Explain the characteristics of Semiconductor diode, Zener diode, NPN Transistor under common emitter , common collector and common base configurations |
| **CO2** | Explain the characteristics of JFET,  UJT and generation of saw tooth waveforms |
| **CO3** | Design characteristics of photo diode & photo transistor, Study of light activated relay circuit. |
| **CO4** | Design and testing of RC phase shift, LC oscillators |
| **CO5** | Analyze the  Single Phase half-wave and full wave rectifiers with inductive and capacitive filters |

**COURSE CODE: C208     EE8311 Electrical Machines Laboratory- I**

| | |
|---|---|
| **CO1** | Estimating the efficiency of DC generators and analyzing their characteristics by experimental load analysis |
| **CO2** | Estimating the efficiency of DC motors and analyzing their characteristics by experimental load analysis |
| **CO3** | Estimating the efficiency of transformers and analyzing their characteristics by experimental  load analysis |
| **CO4** | Estimating the losses, regulation and efficiency  of dc machines and transformers by indirect loading  through various tests. |
| **CO5** | Understanding the operation of various starters of dc motor  and various connections for three phase transformer |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE CODE: C209      MA8491 NUMERICAL METHODS

| | |
|---|---|
| CO1 | Understand the basic concepts and techniques of solving algebraic and transcendental equations. |
| CO2 | Appreciate the numerical techniques of interpolation and error approximations in various intervals in real life situations. |
| CO3 | Apply the numerical techniques of differentiation and integration for engineering problems. |
| CO4 | Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations. |
| CO5 | Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications. |

### COURSE CODE: C210      EE8401 ELECTRICAL MACHINES-II

| | |
|---|---|
| CO1 | Ability to understand the construction and working principle of synchronous generator, mmf curves and armature windings |
| CO2 | Ability to acquire knowledge on synchronous motor. |
| CO3 | Ability to understand the construction and working principle of three phase induction motor |
| CO4 | Ability to understand the construction and working principle of special machines |
| CO5 | Ability to predetermine the performance characteristics of synchronous machine |

### COURSE CODE: C211                EE8402 Transmission and Distribution

| | |
|---|---|
| CO1 | To understand the importance and the functioning of transmission line parameters. |
| CO2 | To understand the concepts of Lines and Insulators. |
| CO3 | To acquire knowledge on the performance of Transmission lines |
| CO4 | To acquire knowledge on Underground Cabilitys |
| CO5 | To become familiar with the function of different components used in Transmission and Distribution levels of power system and modelling of these components. |

### COURSE CODE: C212      EE8403 MEASUREMENTS AND INSTRUMENTATION

| | |
|---|---|
| CO1 | Understand the Design and working of various types of Electrical and Electronics Instruments. |
| CO2 | Analyse and Apply the fundamentals of Electrical and Electronics Instruments. |
| CO3 | Analyse and educate on the comparison between various measurement techniques. |
| CO4 | Understand about the various storage and display devices. |
| CO5 | Design and Assemble the various transducers and data acquisition systems. |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE CODE: C213 EE8451–Linear Integrated Circuits and Applications

| | |
|---|---|
| **CO1** | Ability to understand and implement Boolean Functions. |
| **CO2** | Ability to understand the importance of code conversion |
| **CO3** | Ability to Design and implement 4-bit shift registers |
| **CO4** | Ability to acquire knowledge on Application of Op-Amp |
| **CO5** | Ability to Design and implement counters using specific counter IC. |

### COURSE CODE: C214 IC8451 Control Systems

| | |
|---|---|
| **CO1** | Understand and remember the use of transfer function models for analysis physical systems and introduce the control system components. |
| **CO2** | Provide adequate knowledge in the time response of systems and steady state error analysis. |
| **CO3** | Analyze the basic knowledge in obtaining the open loop and closed–loop frequency responses of systems. |
| **CO4** | Evaluate the stability analysis and design of compensators. |
| **CO5** | Create and introduce state variable representation of physical systems and study the effect of state feedback. |

### COURSE CODE: C215 EE8411 Electrical Machines Laboratory II

| | |
|---|---|
| **CO1** | Ability to understand and analyze EMF & MMF method |
| **CO2** | Ability to analyze the characteristics of **v** and **^** curves |
| **CO3** | Ability to understand the importance of synchronous machines |
| **CO4** | Ability to understand the importance of Induction machines |
| **CO5** | Ability to acquire knowledge in separation of losses |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE CODE: C216    EE8461 Linear and Digital Integrated Circuits Laboratory

| | |
|-----|-------------------------------------------------------------------|
| CO1 | Ability to understand and implement Boolean Functions. |
| CO2 | Ability to understand the importance of code conversion |
| CO3 | Ability to Design and implement 4-bit shift registers |
| CO4 | Ability to acquire knowledge on Application of Op-Amp |
| CO5 | Ability to Design and implement counters using specific counter IC. |

### COURSE CODE: C217                EE8412 Technical Seminar

| | |
|-----|-------------------------------------------------------------------|
| CO1 | Ability to review, prepare and present technological developments |
| CO2 | To encourage the students to study advanced engineering developments |
| CO3 | To prepare and present technical reports |
| CO4 | To encourage the students to use various teaching aids such as overhead projectors, power point presentation and demonstrative models. |
| CO5 | Ability to face the placement interviews |

### COURSE CODE: C301    EE8501 Power System Analysis

| | |
|-----|-------------------------------------------------------------------|
| CO1 | Understanding the need for power system planning and operational studies under steady state operating condition. |
| CO2 | Analyzing the power system by per phase analysis, representation of different components and to construct Ybus and Z bus. |
| CO3 | Applying numerical methods to solve the power flow problem. |
| CO4 | Model and analyze the system under balanced fault conditions, unbalanced fault conditions. |
| CO5 | Formulate swing equation and using numerical to find the solution, understanding the importance of stability analysis of power system. |

### COURSE CODE: C302    EE8551 - Microprocessors and Microcontrollers

| | |
|-----|-------------------------------------------------------------------|
| CO1 | Able to acquire the basic knowledge in 8085 |
| CO2 | Able to write the assembly language program using 8085 |
| CO3 | Able to understand the basic knowledge in 8051 microcontroller |
| CO4 | Able to understand the interfacing and importance of interfacing |
| CO5 | Able to develop the applications of microprocessor and microcontroller |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**COURSE CODE: C303    EE8552 – POWER ELECTRONICS**

| | |
|---|---|
| CO1 | Remembering the different types of power semiconductor devices and understanding thei switching characteristics |
| CO2 | Analyzing the operation, characteristics and performance parameters of controlled rectifiers. |
| CO3 | Understanding the operation, switching techniques and analyzing the different types of DC-DC switching regulators . |
| CO4 | Applying the different modulation techniques in the operation of pulse width modulated inverters. |
| CO5 | Understanding the operation of AC voltage controller and cycloconverters |

**COURSE CODE: C304                EE8591 – Digital Signal Processing**

| | |
|---|---|
| CO1. | Define and classify signals and systems, express signals mathematically, explain Nyquist rate, aliasing and sampling techniques to convert analog to discrete time signals, explain spectral density and quantization and its error. |
| CO2. | Apply z transforms and its properties to solve difference equations of discrete time systems, perform convolution, represent the magnitude and phase response of discrete time signals using Discrete Time Fourier Transform. |
| CO3. | Find the Discrete Fourier Transform of discrete time signals using direct DFT and FFT, analyze the magnitude and phase representation of the Discrete Fourier Transform of discrete time signals. |
| CO4. | Design digital IIR and FIR filters and model digital IIR and FIR filters using alization structures. |
| CO5. | Discuss about architecture, addressing formats, functional modes of digital signal processors, discuss about commercial digital signal processors |

**COURSE CODE: C305            CS8392 – Object Oriented Programming**

| | |
|---|---|
| CO1. | Develop Java programs using OOP principles |
| CO2. | Develop Java programs with the concepts inheritance and interfaces |
| CO3. | Build Java applications using exceptions and I/O streams |
| CO4. | Develop Java applications with threads and generics classes |
| CO5. | Develop event driven programs using AWT |

**COURSE CODE: C306    OAN551- Sensors and Transducers**

| CO1 | Expertise in various calibration techniques and signal types for sensors |
|-----|--------------------------------------------------------------------------|
| CO2 | Apply the various sensors in the electrical and electronic applications |
| CO3 | Apply the various sensors in the Automotive and Mechatronics applications |
| CO4 | Study the basic principles of various smart sensors |
| CO5 | Implement the DAQ systems with different sensors for real time applications |

**COURSE CODE: C307    EE8511 – Control and Instrumentation Laboratory**

| CO1 | Ability to understand control theory and apply them to electrical engineering problems. |
|-----|------------------------------------------------------------------------------------------|
| CO4 | Ability to analyze the various types of converters and design compensators |
| CO3 | Ability to understand the basic concepts of bridge networks. |
| CO4 | Ability to the basics of signal conditioning circuits. |
| CO5 | Ability to study the simulation packages. |

**COURSE CODE: C308    S8581 Professional Communication**

| CO1 | Make effective presentations |
|-----|-------------------------------|
| CO2 | Participate confidently in Group Discussions |
| CO3 | Attend job interviews and be successful in them. |
| CO4 | Develop adequate Soft Skills required for the workplace |
| CO5 | Enhance the Employability and Career Skills of students |

## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**COURSE CODE: C309**          **S8383 Object Oriented Programming Lab**

| | |
|---|---|
| **CO1** | Develop and implement Java programs for simple applications that make use of classes, packages and interfaces. |
| **CO2** | Develop and implement Java programs for simple applications that make use of interfaces. |
| **CO3** | Develop and implement Java programs with array list, exception handling |
| **CO4** | Develop and implement Java programs with multithreading |
| **CO5** | Design applications using file processing, generic programming and event handling. |