

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

List of Subjects:

S.No.	Course code	Subject code	Course Name
Semester V			
1.	C301	EE6501	Power System Analysis
2.	C302	EE6502	Microprocessor and Microcontrollers
3.	C303	ME6701	Power Plant Engineering
4.	C304	EE6503	Power Electronics
5.	C305	EE6504	Electrical Machines – II
6.	C306	IC6501	Control Systems
7.	C307	EE6511	Control and Instrumentation Laboratory
8.	C308	GE6563	Communication Skills – Laboratory Based
9.	C309	EE6512	Electrical Machines Laboratory – II
Semester VI			
10.	C310	EC6651	Communication Engineering
11.	C311	EE6601	Solid State Drives
12.	C312	EE6602	Embedded Systems
13.	C313	EE6603	Power System Operation and Control
14.	C314	EE6604	Design of Electrical Machines
15.	C315	EE6002	Elective I - Power System Transients
16.	C316	EE6611	Power Electronics and Drives Laboratory
17.	C317	EE6612	Microprocessor and Microcontrollers Laboratory
18.	C318	EE6613	Presentation Skills and Technical Seminar
Semester VII			
19.	C401	EE6701	High Voltage Engineering
20.	C402	EE6702	Protection and Switchgear
21.	C403	EE6703	Special Electrical Machines
22.	C404	MG6851	Principles of Management
23.	C405	EE6004	Elective II - Flexible AC Transmission Systems
24.	C406	EE6008	Elective III - Microcontroller Based System Design
25.	C407	EE6711	Power System Simulation Laboratory
26.	C408	EE6712	Comprehension
Semester VIII			
27.	C409	EE6801	Electric Energy Generation, Utilization and Conservation
28.	C410	EE6010	Elective IV - High Voltage Direct Current Transmission
29.	C411	GE6757	Elective V - Total Quality Management
30.	C412	EE6811	Project Work

Course Outcomes of all subjects

Year/Sem: III/V

EE6501-Power System Analysis (C301)	
C301.1	Understand the various power system components and modelling under steady state operating condition
C301.2	Solve the power flow problem by applying numerical method
C301.3	Illustrate the types of faults and their effects and able to calculate the fault currents for symmetrical fault condition
C301.4	Analyze and calculate the unsymmetrical faults occurring at various locations in power system
C301.5	Analyze the stability of single machine infinite bus system and explain the concepts of power system stability

EE6502-Microprocessor and Microcontrollers (C302)	
C302.1	Provide insight into architectural details of microprocessors.
C302.2	Apply the programming using assembly level language in microprocessors and microcontroller.
C302.3	Understand the architecture, Pinouts and I/O ports of 8051 Microcontroller.
C302.4	Design interfacing devices with 8085 & 8051 Microcontroller.
C302.5	Design and implement microprocessor and Microcontroller based applications.

ME6701-Power Plant Engineering (C303)	
C303.1	Describe and analyzedifferent types of sources and mathematical expressions related to thermodynamics and various terms and factors involved with power plant operation.
C303.2	Calculate the performance of gas turbines with reheat and regeneration, and discuss the performance of combined cycle power plants.
C303.3	Gain knowledge of working of Nuclear power plant including working of different types of reactors and safety measures.
C303.4	Able to know which sources of energy will best in future to meet up the energy demand.
C303.5	Extend their knowledge to power plant economics and environmental hazards.

EE6503-Power Electronics (C304)	
C304.1	Analyze the characteristics of different power electronics devices like SCR, BJT, MOSFET and IGBT.
C304.2	Explain the types of power converters and understand the operations of single and three phase converters.
C304.3	Classify the operation of Choppers and outline the application of SMPS.
C304.4	Categorize various single phase and three phase power inverter circuits and understand their applications
C304.5	Illustrate the basic operation and characteristics of AC voltage controllers and cyclo converters

EE6504-Electrical Machines-II (C305)	
C305.1	Explain the constructional feature and principle of operation of an alternator and predetermine the voltage regulation of synchronous machine
C305.2	Describe about the starting methods of synchronous motor and the effects of excitation on armature current and power factor of synchronous motor
C305.3	Illuminate the constructional features and working principle of a 3-phase induction motor and develop an equivalent circuit of a 3 phase induction motor
C305.4	Compare the different starting methods of three phase squirrel cage and slip ring induction motors with merits and demerits
C305.5	Describe the constructional feature and principle of operation of special motors with

	applications
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IC6501-Control Systems (C306)	
C306.1	Explain the uses of transfer function models for analyzing physical systems and relate the control system components.
C306.2	Develop adequate knowledge in the time response of systems, steady state error analysis. And also to build the basics concept of controllers, root locus for stability studies.
C306.3	Distinguish the basic knowledge in obtaining the open loop and closed-loop frequency responses of systems
C306.4	Evaluate the basics of stability studies by various techniques and design of compensator using frequency response analysis
C306.5	Demonstrate the concept of state variable analysis to evaluate the feedback control and the concept of Controllability, observability using state space representation

EE6511-Control and Instrumentation Laboratory (C307)	
C307.1	Graduates will be able to measure and evaluate performance of P, PI and PID controllers. And compensator
C307.2	Students will be able to use modelling parameters with standard models to predict correctly the expected Performance of various general-purpose Modeling of Systems, Machines, Sensors and Transducers
C307.3	Students will be able to prepare professional quality graphical presentations of laboratory data and computational results, incorporating accepted data analysis and synthesis methods of Design of Lag, Lead and Lag-Lead Compensators.
C307.4	Students will work in teams to conduct experiments, analyze results, and develop technically sound reports of outcomes.
C307.5	Primarily via team-based laboratory activities, students will demonstrate the ability to interact effectively on a social and interpersonal level with fellow students, and will demonstrate the ability to divide up and share task responsibilities to complete assignments

GE6563-Communication Skills-Laboratory Based (C308)	
C308.1	Formulate presentations and Participate in Group Discussions.
C308.2	Prepare to answer the questions in interviews.
C308.3	Achieve international examination such as IELTS and TOEFL
C308.4	Improve the fluency in spoken English and improve in leadership trait.
C308.5	Identify their creativity and critical thinking while communicating with others.

EE6512-Electrical Machines Laboratory-II (C309)	
C309.1	The ability to conduct testing and experimental procedures on different types of electrical machines
C309.2	Students will be able to use modeling parameters with standard equivalent circuit models to predict correctly the expected performance of various general purpose electrical machines
C309.3	Ability to prepare professional quality graphical presentations of laboratory data and computational results, incorporating accepted data analysis and synthesis methods
C309.4	Students will work in teams to conduct experiments, analysis results and develop technically sound reports of outcomes
C309.5	Primarily via team based laboratory activities, students will demonstrate the ability to interact effectively on a social and interpersonal level with fellow students, and will demonstrate the ability to divide up and share task responsibilities to complete assignments

EC6651-Communication Engineering (C310)	
C310.1	The students will be able to analyze the concepts of various analog modulations and their spectral characteristics
C310.2	The students will be able to know about the various methods of generation and detection of pulse modulations
C310.3	The students will be able to apply the knowledge to solve the Information Theory problems
C310.4	The students will be able apply the knowledge to different communication protocols and application of wire and wireless communications
C310.5	The students will be able to apply the knowledge about satellite and high speed fiber optic communication

EE6601-Solid State Drives (C311)	
C311.1	Able to explain the concept of steady state operation and transient dynamics of a motor load system.
C311.2	Describe and Analyze the performance of steady state stability of the converter/chopper fed dc drive.
C311.3	Explain the operation and performance of AC motor drives.
C311.4	Apply and analyze margin angle control and power factor control in synchronous motor drives.
C311.5	Analyze and Design the current and speed controllers for a closed loop solid state DC motor drive.

EE6602-Embedded Systems (C312)	
C312.1	Understand the basic concept of embedded system design using modeling language
C312.2	Gain knowledge of embedded networking and its applications
C312.3	Understand the concept of embedded firmware development environment
C312.4	Analyze the different types of real time in static and dynamic system
C312.5	Apply the knowledge of system design in different types of embedded applications

EE6603-Power System Operation and Control (C313)	
C313.1	Explain impact of load characteristics on power system operation and control.
C313.2	Describe and analyze the LFC control attributes for single and double area systems.
C313.3	Summarize the various voltage control methods for reactive power compensation.
C313.4	Solve the problems on dispatch of load economically among the thermal plants.
C313.5	Examine the concepts of SCADA system for power system operation and control

EE6604-Design of Electrical Machines (C314)	
C314.1	Define the knowledge on basic principles of static and rotating machine design
C314.2	Design and illustrate the basic construction of DC machines and transformer
C314.3	Analyze the output characteristics and efficiency of induction motor
C314.4	Demonstrate the characteristics of synchronous machine and its output characteristics
C314.5	Conclude at designing and estimation of AC and DC machines with circuit ratio

EE6002-Power System Transients (C315)	
C315.1	Able to explain the various types of generation of power system transients
C315.2	Describe and analyze the switching transients under different operating conditions
C315.3	Summarized the list of mechanism of lightning strokes and production of surges
C315.4	Apply the basic concepts for different response of travelling waves
C315.5	Compare the impact of various transients caused in power system

EE6611-Power Electronics and Drives laboratory (C316)	
C316.1	Construct the static characteristics of various power devices like SCR, MOSFET and

	IGBT.
C316.2	Design and obtain the controlled characteristics of half and fully controlled converter
C316.3	Outline the characteristics and performance of single, three phase PWM inverters
C316.4	Model the semi converter, full converter, dc-dc chopper and voltage controller by MATLAB Simulation.
C316.5	Inspect the output response of step up, step down MOSFET based chopper and Voltage Regulator.

EE6612-Microprocessor and Microcontrollers Laboratory (C317)

C317.1	The ability to write program and execution procedures on different types of processor
C317.2	Students will be able to interface different peripherals to the processor.
C317.3	Ability to prepare assembly level language for controller like PIC
C317.4	Students will work in teams to conduct experiments, analyze results, and develop technically sound reports of outcomes.
C317.5	Primarily via team-based laboratory activities, students will demonstrate the ability to interact effectively on a social and interpersonal level with fellow students, and will demonstrate the ability to divide up and share task responsibilities to complete assignments.

EE6613-Presentation Skills and Technical Seminar (C318)

C318.1	Ability to review, prepare and present technological developments
C318.2	Ability to face the placement interviews
C318.3	Learners should be able to speak clearly, confidently, comprehensibly, and communicate with one or many listeners using appropriate communicative strategies.
C318.4	Read different genres of texts adopting various reading strategies.
C318.5	Listen/view and comprehend different spoken discourses/excerpts in different accents

Year/Sem: IV/VII

EE6701-High Voltage Engineering (C401)

C401.1	Explain the concepts of over voltages in power system and protection methods
C401.2	Classify the dielectric breakdown and its mechanism in solid ,liquid and gas
C401.3	Describe the principles of the generation and measurement of high DC, AC and impulse voltages and currents
C401.4	Analyze the various techniques to measure the high voltage and currents using special meters
C401.5	Compare various testing methods of insulators, transformers, circuit breakers, isolators, surge arrestors and apply the insulation coordination in power systems.

EE6702-Protection and Switchgear (C402)

C402.1	Classify the various causes of abnormal operating conditions and their protection schemes.
C402.2	Construct the characteristics and functions of electromagnetic relays and their protection schemes.
C402.3	Apply the basic concept of various apparatus protection in the power system.
C402.4	Evaluate the various static and numerical relays and their protection schemes.
C402.5	Elaborate the concept on functioning of circuit breakers in power system.

EE6703-Special Electrical Machines (C403)

C403.1	Impart the construction and performance of synchronous reluctance motors in
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	industries.
C403.2	Understand the performance of the stepper motors and its characteristics.
C403.3	Explain the Construction, principle of operation, control and performance of switched reluctance motor
C403.4	Illustrate the Nature of BLDC motor performances and its applications.
C403.5	Describe the knowledge about the Construction, principle of operation and performance of permanent magnet synchronous motors

MG6851-Principle of Management (C404)

C404.1	Explain the elements of Management and Organization
C404.2	Summarize the types, policies, tools and techniques in Planning in Management
C404.3	Relate the job design and human resource management in Organizing
C404.4	Illustrate the skills of leadership and communication
C404.5	Interpret the controlling techniques in Management

EE6004-Flexible AC Transmission Systems (C405)

C405.1	Ability to understand the concept of reactive power control using various types of FCATS devices.
C405.2	Ability to understand construction and working of SVC controller with modelling.
C405.3	Ability to have the knowledge on basic operation of TCSC with various applications.
C405.4	Ability to understand construction and working of STATCOM & SSSC controller.
C405.5	Ability to understand the co-ordination of FACTS devices in multilane transmission system using linear and nonlinear control techniques.

EE6008-Microcontroller Based System Design (C406)

C406.1	Explain the architecture of PIC microcontroller and addressing modes and simple programs.
C406.2	Examine the utilization of interrupt operations and timer operations.
C406.3	Inspect the interfacing of peripheral devices for data communication and data transfer.
C406.4	Summarize the functional blocks of ARM processor
C406.5	Investigate the different applications of ARM processors.

EE6711-Power System Simulation Laboratory (C407)

C407.1	Determine the bus impedance and admittance matrices using MATLAB
C407.2	Apply numerical methods for solving load flow problems and verify using MATLAB
C407.3	Analyze various faults occurring in power system and simulate the faults using PSCAD
C407.4	Analyze small signal stability of Single Machine Infinite Bus (SMIB) system and draw the swing curve using MATLAB.
C407.5	Generate the coding for economic dispatch problems and load frequency dynamics problems using MATLAB.

EE6712-Comprehension (C408)

C408.1	Acquire knowledge on electrical and electronics area
C408.2	Ability to easily convey their innovative technical thoughts among their colleague with ICT tools
C408.3	Students can able to overcome the stage fear and time management during presentation
C408.4	Graduates can able to make an impressive presentation which makes the easy communication with others
C408.5	Students will be able to develop their skills for placement like stage fear, interaction

	with others, technical skills, communication and body language
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Year/Sem: IV/VIII

EE6801-Electric Energy Generation, Utilization and Conversion	
C409.1	Analyze the various concepts behind electrification and energy consumption.
C409.2	Demonstrate the understanding of energy saving concept by different ways of illumination.
C409.3	Illustrate the different methods of electric heating and electric welding.
C409.4	Investigation and applying knowledge on solar radiation and solar energy collectors.
C409.5	Equip the students to apply and analyze the concepts of wind energy and its utilization.

EE6010-High Voltage Direct Current Transmission	
C410.1	Explain the basic concept of generation of DC transmission.
C410.2	Describe and analyze the different types of topologies of HVDC converters.
C410.3	Summarize the types of control techniques used for HVDC transmission.
C410.4	Apply the concept of generation of harmonics to design a proper filter circuits.
C410.5	Explain the DC system under various conditions.

GE6757-Total Quality Management	
C411.1	Outline the Dimensions and Barriers regarding with Quality.
C411.2	Illustrate the TQM Principles.
C411.3	Demonstrate Tools utilization for Quality improvement.
C411.4	Explain the various types of Techniques are used to measure Quality.
C411.5	Apply various Quality Systems and Auditing on implementation of TQM.

EE6811-Project Work	
C412.1	Identify the real world problems of electrical engineering.
C412.2	Understand the working of various models in the electrical engineering systems.
C412.3	Apply the principles of electrical engineering in the real world systems.
C412.4	Criticize and experiment to arrive at solution for the electrical engineering problems.
C412.5	Explain the solution by effective presentation and involved active member in the team leads to lifelong learning.