ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET

(AN AUTONOMOUS INSTITUTION)

III B. Tech., II Semester

7G165-OBJECT ORIENTED PROGRAMMING CONCEPTS	**L**	**T**	**P**
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Course Objective:

The aim of this course is to introduce programming in Java in accordance with Object-Oriented Programming concepts.

Unit I

Introduction: Introduction to structure programming - Object-oriented paradigm, elements of object oriented programming – Merits and demerits of OO methodology - Data types - loops - pointers –arrays – structures – functions – Classes – Objects- Constructor and destructor

Unit II

Overloading: Operator overloading – function overloading .

Inheritance –Types of Inheritance- virtual base class - friend function - Polymorphism –this pointer – virtual functions-pure virtual function- Input / Output streams - **Files** streams — manipulators – Templates

Unit III

Introduction to Java: Java vs. C++ - data types – operators – Decision making - branching -loops - classes – objects-arrays- methods –scope - string handling.

Unit IV

Inheritance: Types **Packages** API packages – creating packages – adding class to package – interfaces **Exception handling**- predefined and user defined.

Unit V

Multi threaded programming –creating threads- extending the thread class- life cycle of threads- **Applet Programming** – applet life cycle- creating executable applet – passing parameters to applets - Streams in Java.

Text Books

1. E.Balaguruswamy, “Object Oriented Programming with C++”,(4th Edition), Tata McGraw Hill Publications Limited, 2008 (Unit I & II)

2. E. Balaguruswamy, “Programming with Java- A Primer ” (3rd Edition), Tata McGraw Hill Publications Limited, 2007. (Unit III,IV,V)
3. Patrick naughton , “The Java Handbook “,Tata McGraw Hill Publications Limited, 2006.(Unit III,IV,V)

Reference books:

1. K.R.Venugopal, RajkumarBuyya, T.Ravishankar, "Mastering C++", TMH, 2003
2. Robert Lafore – “OBJECT ORIENTED PROGRAMMING IN Turbo C++”, Waite Group; 3rd edition (December 1998)
3. Bruce Eckel, “Thinking in Java”, (4th Edition) Prentice Hall PTR, 2006
4. 4.Herbert Schildt, "the Java 2 : Complete Reference", Fourth edition, Tata McGraw Hill Publications Limited, 2002.

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

1. Understand the Basics object-oriented programming concepts
2. Understand and apply the object oriented concept like Classes and Objects, encapsulation, Inheritance, Polymorphisms in c++
3. Understand java environment and its features
4. Understand and apply the object oriented concept like Classes and Objects, encapsulation, Inheritance, Interface, Polymorphisms in java.

COs-POs-PSOs Mapping Table

Course Outcomes	Program Outcomes												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	-	3	-	-	1	-	-	-	-	-	1	3	3
CO2	3	-	3	-	1	1	-	-	1	1	-	3	3	3
CO3	3	-	2	-	-	1	-	-	-	-	-	2	3	3
CO4	3	-	3	-	1	2	1	-	2	2	-	3	3	3

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7G261-POWER SYTEM OPERATION AND CONTROL

Course Objectives:

- To familiarize the students with economic operation of power systems.
- To provide knowledge about modeling of Power Plant Components.
- To prepare the students to realize the need of controlling the frequency, voltage and reactive power in a power system.

Unit I

OPTIMAL OPERATION OF POWER GENERATING SYSTEMS: Input-Output Characteristics of Thermal and Hydro Power Plants - Heat rate Curve - Cost Curve- Incremental Fuel Cost -Incremental Production Cost - Optimal operation of Generators in Thermal Power Stations without losses (with and without generating limits)-Computational methods for solving Optimization Problem (Theory) - Optimum Generation Allocation with Line Losses- Penalty factor - Loss Coefficients General transmission line loss formula, Numerical Problems.

Unit II

HYDROTHERMAL SCHEDULING AND UNIT COMMITMENT: Optimal scheduling of Hydrothermal System: Hydroelectric power plant models, - short term Hydro thermal scheduling problem - Unit Commitment vs Economic Dispatch- Constraints in unit commitment start-up and shut-down costs, up time and down time constraints- Unit commitment solution methods - Priority-List method, Dynamic Programming method(only Theory)

Unit III

MODELING OF POWER PLANT COMPONENTS: Modeling of Turbine: First order Turbine model, Block Diagram representation of Steam Turbines and Approximate Linear Models.

Modeling of Speed Governor: Mathematical Modeling of Speed Governing System – Derivation of small signal transfer function.

Modeling of Excitation System: Fundamental Characteristics of an Excitation system, Transfer function, Block Diagram Representation of IEEE Type-1 Model. Steady state analysis, Dynamic response (Uncontrolled case and Controlled Case) – Proportional plus Integral control of single area and its block diagram representation –Steady state analysis and dynamic response.

Unit IV

SINGLE AREA & TWO-AREA LOAD FREQUENCY CONTROL: Necessity of keeping frequency constant. Definitions of Control area – Single area control – Block diagram representation of an isolated power system – Steady state analysis – Dynamic response – Uncontrolled case.

Load frequency control of Two-area system: Uncontrolled case and controlled case, tie-line bias control.

Load Frequency Controllers: Proportional plus Integral control of single area and its block diagram representation, steady state response – Load Frequency Control and Economic dispatch control

Unit V

REACTIVE POWER CONTROL: Overview of Reactive Power control – Reactive Power compensation in transmission systems.

Line compensation: Uncompensated and compensated transmission lines: shunt and Series Compensation (Only using Passive Elements) - advantages and disadvantages of different types of compensating equipment for transmission systems.

Load compensation: Load compensation (simple problems) - Specifications of load compensator.

Text Books:

1. Chakrabarthi and S. Halder, Power System Analysis Operation and Control , 3rd Edition, Prentice Hall India.
2. I.J. Nagrath & D.P. Kothari, Modern Power System Analysis , 4th Edition, Tata Mc Graw Hill.
3. C.L.Wadhwa, Electrical Power Systems , 4th Edition, New age International.

Reference Books:

1. S. Sivanagaru & G. Sreenivasan, Power System Operation and Control, 1st Edition,2009 Pearson Publications.
2. S.N. Singh, Electric Power Generation, transmission and Distribution , 2nd Edition, Prentice Hall India.
3. Hadi Saadat, Power System Analysis , TMH Edition 3rd , 2011.

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

1. Explore the significance of optimal operation and scheduling of Hydro Thermal Systems.
2. Recognize the need of modeling and carry out the Load Frequency Control in Power Systems.
3. Identify the necessity of the Reactive Power Control in Transmission lines and Load End.

COs-POs-PSOs Mapping Table

Course Outcomes	Program Outcomes												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	3	2	3	-	-	2	2	2	3	3	3	3	3
2	3	3	2	-	-	-	3	-	3	2	-	-	3	3
3	3	3	2	3	-	-	2	2	2	2	3	3	3	3

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7G262-MICROPROCESSORS AND MICROCONTROLLERS

Course Objective:

To understand the hardware and software details of 8086 microprocessor and 8051 micro controller and their interfacing with memory and I/O devices, programming knowledge on the above to implement real time projects.

Unit I

8086 Architecture And Programming: Architecture of 8086 microprocessor, Register organization, Memory organization, Pin diagram, Minimum mode and maximum mode of operation, Timing diagrams. Machine language instruction formats, addressing modes, instruction set. Assembler directives, Assembly language programs involving logical, branch and call instructions, sorting, string manipulation. Procedure and Macros.

Unit II

Data Transfer Methods And I/O Interfacing Of 8086: Programmed I/,O Interrupt driven I/O,DMA ,Need for DMA, Architecture of 8257, Architecture of 8255 PPI and its various modes of operation.

I/O Interfacing methods – I/O mapped I/O, Memory mapped I/O .8255 interfacing to 8086, Interrupt structure of 8086, Vector interrupt table. Interrupt service routines. 8259 PIC architecture.

Unit III

Communication Interface: Asynchronous and synchronous data transfer schemes. Necessity of communication interfaces, 8251 USART architecture and interfacing. Serial communication standard-RS-232C, TTL to RS232C and RS232C to TTL conversion.

Unit IV

8051 MICROCONTROLLER: Architecture of 8051, pin diagram, memory organization, Addressing modes, instruction set, simple Programs, Timers/Counters, Serial Communication features, Interrupts.

Unit V

ADVANCED MICROCONTROLLERS: The ARM Architecture, ARM7, ARM9, Features and applications of ARM.

ARDUINO: Block diagram, Architecture, Pin functions, overview of main features such as I/O Ports, Timers, interrupts serial port, PWM, ADC.

Text Books:

1. A.K. Ray and K.M.Bhurchandi. *Advanced microprocessors and peripherals*. 3rd edition. TMH. 2013.
2. Muhammad Ali Mazidi. 8051 *Microcontroller and embedded systems using assembly and c*.2nd edition, Pearson Eduction. 2008.
3. Barry B.Brey The Intel microprocessors architecture, programming and interfacing.8th edition, Pearson Education. 2009.

Reference Books:

1. Douglas V.Hall. *Microprocessors and Interfacing*. 2nd edition,TMH, 2007.

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

1. Analyze the hardware design of 8086 microprocessor and is able to write assembly language programs.
2. Understand the programmable (8255-PPI) and non programmable interfacing methods of 8086.
3. Learn the interrupt programming of 8086 microprocessor.
4. Know the basic communication methods and communication interfacing programming of 8086 microprocessor.
5. Identify the difference between 8086 microprocessor based system design and 8051 microcontroller based system design.

COs-POs-PSOs Mapping Table

Course Outcomes	Program Outcomes												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	2	-	-	-	2	-	-	-	-	2	-	2	2	2
2	2	-	2	2	2	-	-	-	-	-	-	2	-	2
3	2	-	-	2	2	-	-	-	2	-	-	2	2	-
4	-	-	-	-	-	-	-	-	-	2	2	2	2	2
5	-	-	2	2	2	-	-	-	2	-	2	2	-	2

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7G263- SWITCH GEAR AND PROTECTION

Prerequisites: Courses on Transformers and Induction Machines, Synchronous Machines and Transmission & Distribution.

COURSE OBJECTIVES:

Overview of protection schemes; Fuses and circuit breakers; Electromagnetic, static and microprocessor based relays; Protection schemes for various components under various operating conditions; Neutral grounding.

Unit I

Circuit Breakers: Fuses— HV AC Fuses (Cartridge HV HRC, liquid type HV HRC, Expulsion type HV), LV AC rewirable fuse-Isolators(Double break, Single Break, Pantograph)- Circuit Breakers: Elementary principles of arc interruption, Restriking Voltage and Recovery voltages - Average and Max. RRRV, Numerical Problems - Current Chopping and Resistance Switching - Description and Operation of following types of circuit breakers: Minimum Oil Circuit breakers, Air Blast Circuit Breakers, Vacuum and SF6 circuit breakers.

Unit II

Electromagnetic And Static Relays: Electromagnetic relays: Introduction, types of relays, construction, operation and torque equation of induction type relays, differential relays and biased differential relays. Characteristics of over current, directional and distance relays (R-X).

Static relays: Advantages and disadvantages block diagram of a basic static relay, definite time, inverse and inverse definite minimum time (IDMT) static relays. Comparators - amplitude and phase comparators.

Unit III

Protection of Generator And Transformer: Protection of generators against Stator faults, Rotor faults, and Abnormal Conditions. Restricted Earth fault and Inter-turn fault Protection. Numerical Problems on % Winding Unprotected.

Protection of transformers: Percentage Differential Protection, Numerical Problem on Design of CTs Ratio, Buchholtz relay Protection.

Unit IV

Protection of Feeders And Transmission Lines: Protection of Feeder (Radial & Ring main) using over current Relays. Protection of Transmission line – 3 Zone protection using Distance Relays, Carrier current protection, Protection of Bus bars.

Unit V

Neutral Grounding And Protection Against Over Voltages: Grounded and Ungrounded Systems- Effects of Ungrounded Neutral on system performance, Methods of Neutral Grounding: Solid, Resistance, Reactance and Peterson coil grounding- Grounding Practices, Numerical Problems.

Protection against Over Voltages: Causes of over voltages in power systems, protection against lightning over voltages - non-linear (valve type) and metal oxide (zinc-oxide) surge arresters, surge absorbers.

Text Books:

1. Sunil S Rao , *Switchgear and Protection* , KhannaPubllishers
2. Badari Ram, D.N Viswakarma, *Power System Protection and Switchgear* TMH Publications.
3. Y. G. Paithankar and S. R. Bhide, *Fundamentals of Power System Protection*2nd Edition, PHI.

Reference Books:

1. Y.G. Paithankar, Taylor and Francis ,*Transmission network Protection* ,2009.
2. BhuvaneshOza ,*Power system protection and switch gear* , TMH, 2010.
3. C.L.Wadhwa , *Electrical Power Systems* , New Age international (P) Limited, Publishers, 3nd edition
4. Christopoulos and A. Wright, *Electrical power System Protection* 2nd Edition, Springer International Edition.

COURSE OUTCOMES: On successful completion of the course, students will be able to

1. Understand AC fuses and different circuit breakers.
2. Analyze different protective devices and protection schemes under various operating conditions.
3. Design proper protection scheme for different power system components.
4. Evaluate operating parameters and setting of protective device in different protection schemes to provide feasible solutions.

COs-POs-PSOs Mapping Table

Course Outcomes	Program Outcomes												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	-	-	3	-	3	3	-	-	-	-	-	-	-	-
2	-	3	3	3	3	3	3	-	-	-	-	-	-	-
3	3	-	3	3	3	3	3	-	-	-	-	-	-	-
4	-	2	2	2	2	2	2	2	-	-	-	-	-	-

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III B.Tech. EEE-II Semester

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7G264-POWER SYSTEM ANALYSIS

Course objectives:

1. To know the formation of Y_{bus} and Z_{bus} for Power flow studies.
2. To calculate Load flows by using various Methods.
3. To model and analyze the power system under abnormal conditions
4. To Model and analyze power system for steady state and transient stability.

UNIT I

Power System Network Matrices: Representation of Power system elements. Bus Incidence Matrices. Y_{br} and Z_{loop} formation using singular transformation method. Y_{bus} formation by Direct and Singular Transformation Methods.

Formation of Z_{Bus}: Partial network, Algorithm for the Modification of Z_{Bus} Matrix for addition of elements (Type-1 modification to Type 4 Modification) - Derivations and Numerical Problems. Modification of ZBus for the changes in network (Problems).

UNIT II

Power Flow Studies: Necessity of Power Flow Studies – Data for Power Flow Studies – Derivation of Static load flow equations – Load flow solutions using Gauss Seidel Method: Acceleration Factor, Load flow solution with and without P-V buses, Algorithm. Numerical Load flow Solution for Simple Power Systems (Max. 3-Buses): Determination of Bus Voltages, Injected Active and Reactive Powers (Sample One Iteration only) and finding Line Flows/Losses for the given Bus Voltages.

Newton Raphson Method in Rectangular and Polar Co-Ordinates Form: Load Flow Solution with or without PV Buses- Derivation of Jacobian Elements, Algorithm and Flowchart. Decoupled and Fast Decoupled Methods. - Comparison of Different Methods.

UNIT III

Short Circuit Studies: Per Unit system of representation. Per-unit equivalent reactance network of a three phase power system.

Symmetrical Component Transformation, positive, negative and zero sequence components: Voltages, Currents and Impedance Sequence Networks: Positive, Negative and Zero sequence Networks, Numerical Problems. Symmetrical fault analysis: Short circuit Current and MVA

Calculations, Application of Series Reactors. Unsymmetrical Fault Analysis: LG, LL, LLG faults with and without impedance, Numerical Problems.

UNIT IV

Power System Steady State Stability Analysis: Elementary concepts of Steady State, Dynamic and Transient Stabilities. Description of Steady State Stability Power Limit, Transfer Reactance, Synchronizing Power Coefficient, Power Angle Curve and Determination of Steady State Stability and Methods to improve steady state stability.

UNIT V

POWER SYSTEM TRANSIENT STATE STABILITY ANALYSIS: Derivation of Swing Equation. Determination of Transient Stability by Equal Area Criterion, Application of Equal Area Criterion-sudden change in mechanical input, sudden loss of one of parallel lines, sudden short circuit on one of parallel lines, Critical Clearing Angle Calculation - Solution of Swing equation by point by point method - Methods to improve Stability.

Text Books:

1. Stagg & El – Abiad. Computer Methods in Power Systems. McGraw-hill Edition.
2. I.J.Nagrath & D.P.Kothari. Modern Power system Analysis. 4th edition. Tata McGraw-Hill Publishing Company, 2011.

Reference Books:

1. K.Umararao Computer Techniques and Models in power systems, I.K.International Publishing house Pvt.Ltd.2007
2. Grainger and Stevenson. Power System Analysis. Tata McGraw Hill. 2003.
3. M A Pai. Computer Techniques in Power System Analysis. 2nd Edition. Tata McGraw Hill. 2006.
4. Glovar and Sarma. Power System Analysis.4 th Edition Thomson Publishers. 2008.
5. Hadi & Sadath. Power System Analysis. Tata McGraw Hill. 2004.
6. B.R.Gupta. Power System Analysis and Design. 6th Revised Edition. S. Chand & Co. 2010.

Course outcome By the end of this course, students will be able to:

1. Formulate the mathematical modeling of power system.
2. Perform load flow computations and analyze the load flow results.
3. Analyze different faults in a power system
4. Create Computational models for analysis of both symmetrical and Unsymmetrical conditions in power systems.

5. Know the steady state stability status of the power system.
6. Know the transient state stability status of the power system

COs-POs-PSOs Mapping Table

Course Outcomes	Program Outcomes												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	1	1	-	2	-	-	-	-	1	1	1	3	3
2	2	1	1	-	1	-	-	-	-	1	1	1	3	3
3	3	2	3	-	3	-	-	-	-	1	2	1	3	3
4	2	2	2	-	3	-	-	-	-	1	3	1	3	3
5	1	1	2	-	3	-	-	-	-	1	2	1	3	3
6	1	1	2	2	2	-	-	-	-	1	1	1	3	3

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7G265-UTILIZATION OF ELECTRICAL ENERGY

Course Objective:

The purpose of this course is to enable the students to have fair knowledge about electric heating, welding, illumination, traction and their industrial applications.

Unit I

ELECTRIC DRIVES: Types of electric drives - choice of motor - starting and running characteristics - speed control - Temperature rise – particular applications of electric drives - types of industrial loads - Continuous - intermittent and variable loads - load equalization.

Unit II

ELECTRIC HEATING & WELDING: Advantages and methods of electric heating - resistance heating, design of heating element, problems - induction heating, Induction cooking and dielectric heating-Electric welding - resistance and arc welding - electric welding equipment - comparison between A.C. and D.C. Welding.

Unit III

ILLUMINATION: Introduction - terms used in illumination - laws of illumination - sources of light -– comparison between tungsten filament lamps and fluorescent tubes – mercury vapour and sodium vapour lamps– compact fluorescent lamp -LED- Basic principles of light control- street lighting and flood lighting.

Unit IV

ELECTRIC TRACTION-I: System of electric traction and track electrification - Mechanics of train movement , Speed-time curves for different services – trapezoidal and quadrilateral speed time curves, problems. Calculations of tractive effort – power - specific energy consumption for given run, effect of varying acceleration and braking retardation - adhesive weight and Coefficient of adhesion, problems

Unit V

ELECTRIC VEHICLES: Introduction to electric vehicles, principle, working and design of electric and hybrid vehicles, history of hybrid & electric vehicles, social & environmental importance of hybrid & electric vehicles, impact of modern drive trains on energy supplies.

TEXT BOOKS:

1. J.B. Gupta. *Utilization of Electrical Power and Electric Traction*. S.K. Kataria and Sons.2007.
2. B.R. Gupta. *Generation of Electrical Energy*. Eurasia publishing House (P) Ltd ,New Delhi. 2010.

Reference Books:

1. N.V. Suryanarayana. *Utilization of Electrical Power including Electric drives and Electric traction*. New Age International (P) Limited Publishers. 1996.
2. C.L. Wadhwa. *Generation, Distribution utilization of Electrical Energy*. New Age International Pvt .Ltd. 2011.
3. E. Openshaw Taylor. *Utilisation of Electric Energy*. Orient Longman, 2009
4. Dr.S. L Uppal."*Electric Power"*, Khanna Publications., 2008

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

1. Understand the various types of Electrical Drives & its applications
2. Apply the methods of Electrical Heating & welding
3. Analyze the Illumination phenomena & various Lighting schemes
4. Understand the different system of track electrification, speed time curves, tractive effort and specific energy consumption
5. Understand the principal , working and significance of electric vehicle

COs-POs-PSOs Mapping Table

Course Outcomes	Program Outcomes												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	1	1	1	-	-	-	-	-	-	-	-	-	1	-
2	2	2	-	-	-	2	2	-	-	-	-	-	2	-
3	2	2	2	-	-	2	2	-	2	-	-	-	2	-
4	2	2	-	-	-	2	2	-	2	-	-	-	2	-
5	1	1	-	-	-	1	1	-	1	-	-	-	1	1

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7G16H-OBJECT ORIENTED PROGRAMMING CONCEPTS LAB

EXERCISE PROGRAMS

PROGRAMS IN C++ / JAVA

1. Classes and objects, Constructor and Destructors.
2. Function Overloading.
3. Inheritance.
4. Operator overloading.
5. Friend function, Templates.
6. Simple Java applications - Handling Strings in java.
7. Simple Package creation - Developing user defined packages in Java.
8. Interfaces in JAVA.
9. Threading and Multithreading (Simple Experiments).
10. Exception Handling Mechanism in Java - Handling pre - defined exceptions – Handling user-defined exceptions.
11. Applets creations.

COs-POs-PSOs Mapping Table

Course Outcomes	Program Outcomes												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	-	2	-	-	1	-	-	-	-	-	1	1	-
2	3	-	3	-	1	1	-	-	1	1	-	3	3	-
3	3	-	2	-	-	1	-	-	-	-	-	2	2	-
4	3	-	3	-	1	2	1	-	2	1	-	3	3	-

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7G266-POWER ELECTRONICS AND SIMULATION LAB

Any **Ten** of the following experiments are to be conducted

1. Gate firing circuits for SCR's(R, RC Triggering, UJT firing circuit).
2. Forced commutation circuits (Class A, Class B).
3. Single phase half controlled bridge converter with R and RL loads.
4. Single phase fully controlled bridge converter with R and RL loads. .
5. DC Jones chopper with R and RL Loads.
6. Single phase series inverter with R and RL loads.
7. Single phase parallel inverter with R and RL loads.
8. Single phase AC voltage controller with R and RL Loads.
9. Single phase cyclo converter with R and RL loads.
10. Single phase dual converter with RL load.
11. Simulation of single-phase fully controlled rectifier with R, RL&RLE loads.
12. Simulation of single phase full bridge Inverter with PWM control.
13. Simulation of single-phase full wave AC voltage controller with R, RL loads.
14. Simulation of single phase bridge type cyclo converter with R load.

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

CO1: Able to analyze various characteristics of semi conductor devices with their firing circuits and commutation methods

CO2: Able to design and implement AC to DC converters with different loads

CO3: Able to work on DC to DC converters

CO4: Able to analyze DC to AC converters with different loads

CO5: Able to design and analyze AC to AC converters with different loads

COs-POs-PSOs Mapping Table

Course Outcomes	Program Outcomes												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	3	3	3	3	-	-	-	-	-	-	-	3	-
2	3	3	3	3	3	2	-	-	-	-	-	-	3	2
3	3	3	3	3	3	-	-	-	-	-	-	2	3	-
4	3	3	3	3	3	3	-	-	-	-	-	2	3	2
5	3	3	3	-	3	3	-	-	-	-	-	-	3	-

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7G267- POWER SYSTEMS LAB-I

Any Ten Experiments:

1. Characteristics of IDMT Over Current Relay (Electromagnetic Type).
2. Characteristics of Negative Phase Sequence relay (Static Type).
3. Characteristics of Percentage biased differential Relay (static type).
4. Characteristics of Over Voltage Relay (Electromagnetic Type).
5. Characteristics of over voltage/under voltage relay (Micro processor Based Type).
6. Characteristics of Percentage Biased Differential Relay (Electromagnetic Type).
7. Determination of ABCD parameters of transmission lines
8. Determination of regulation and efficiency of a transmission line
9. Ferranti effect
10. Separation of No-Load Losses of Three Phase Squirrel cage Induction motor.
11. Equivalent Circuit of three winding transformer.
12. Power Angle Characteristics of Salient pole Synchronous machine.
13. Determination of Sub transient Reactance of Salient pole Synchronous Machine.
14. Study of Radial Feeder
15. Study of Time Grading

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

CO1: Understand the performance relay of operation

CO2: Understand the Performance of Transmission lines

CO3: Analyze the performance of ac machines

COs-POs-PSOs Mapping Table

Course Outcomes	Program Outcomes												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	3	3	3	3	-	-	-	3	-	3	3	3	3
2	3	3	3	3	3	-	-	-	3	-	3	3	3	3
3	3	3	3	3	3	-	-	-	3	-	3	3	3	3

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7GC62-ENGLISH FOR COMPETITIVE EXAMINATIONS
(Common for EEE, ME & ECE)

UNIT I

Vocabulary: Synonyms – Antonyms – Analogy – Words often confused, One-word substitutions – Idioms and Phrases – Homonyms – Spellings

UNIT II

Comprehension Ability: Reading comprehension – Cloze tests

UNIT III

Correct English Usage: Articles – Prepositions – Tenses – Voice – Error spotting and correcting – Sentence improvement

UNIT IV

Logic-based English Language: Rearrangement of jumbled words and jumbled sentences – word pairs – sentence completion

Note: For every two contact hours, one practice test containing objective questions on related concepts will be conducted and answers will be explained thoroughly by the trainer. At the end of the semester, a minimum of 10 papers will have been practiced by students.

As regular method of external assessment is not found suitable, 100 marks will be awarded for internal examinations (30 marks from the average of two Internal Mid Exams and 70 for Internal End Exam)

References books:

1. R. S. Agarwal, “Objective English”, S.Chand Publishers
2. Hari Prasad, “Objective English for Competitive Exams”, TMH
3. Collins Cobuild, “English Guides: Confusable Words”

Course Outcomes: Student will able to

1. Achieve proficiency in english synonyms, antonyms, idiomatic expressions and, accuracy in english spelling
2. Apply active reading strategies in order to comprehend, critically analyze and make inferences and predictions based on information in the text

3. Apply his/her knowledge of articles, prepositions, tenses and voice correct errors or improve sentences
4. Form meaningful sentences/passages out of the scrambled words/sentences