MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRICAL ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

COs, POs, PSOs Mapping

Subject: POWER SYSTEM ANALYSIS	**Subject Code: BELEE0-101**	**Semester: 1st**
Credit: 3	**L T P 3 0 0**	**Duration: 40 Hrs.**

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Able to calculate voltage phasor at all buses, given the data using various methods of load flow		3								3	2
CO2.	Able to calculate fault currents in each phase		3								3	2
CO3.	Rank various contingencies according to their severity.			3							3	2
CO4.	Estimate the bus voltage phasor given various quantities viz. power flow, voltages, taps, CB status etc		3								3	2
CO5.	Estimate closeness to voltage collapse and calculate PV curves using continuation power flow		3	3							3	2

Subject: POWER SYSTEM DYNAMICS - I	**Subject Code: MELEE1-102**	**Semester: 1st**
Credit: 2	**L T P 3 0 0**	**Duration: Hrs.**

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Understand the modeling of synchronous machine in details.				3					1	3	2
CO2.	Carry out simulation studies of power system dynamics using MATLAB-SIMULINK, MI POWER.					3				1	3	2
CO3.	Carry out stability analysis with and without power system stabilizer (PSS).		3							1	3	2
CO4.	Understand the load modeling in power system.				3					1	3	2

Subject: Research Methodology and IPR	**Subject Code: MRMIP-101**	**Semester: 1st**
Credit: 2	**L T P 2 0 0**	**Duration: 28 Hrs.**

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Understand research problem formulation, analyze research related information, Follow research ethics.		3	3					2			3
CO2.	Understand that today's world is controlled by computer, information technology, but tomorrow world will be ruled by ideas, concept, and creativity.	3								3		
CO3.	Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular.	3								3		
CO4.	Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.	3								3		

Subject: Renewable Energy System and Distributed Generation	**Subject Code: MELEE1-156**	**Semester: 1st**
Credit: 3	**L T P 3 0 0**	**Duration: 40 Hrs.**

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Know about various renewable energy sources.	3								3		
CO2.	Understand the working of distributed generation system in autonomous / grid connected modes.	3								3		
CO3.	Know the impact of distributed generation on power system	3								3		

Subject: Smart Grids	Subject Code: MELEE1-157	Semester: 1st
Credit: 3	L T P 3 0 0	Duration: 40 Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO 1.	Appreciate the difference between smart grid & conventional grid.	3	1							3		
CO 2.	Apply smart metering concepts to industrial and commercial installations.	3				3				3	3	
CO 3.	Formulate solutions in the areas of smart substations, distributed generation and wide area measurements.	3			3	2				3	3	
CO 4.	Come up with smart grid solutions using modern communication technologies	3			3	3				3	3	

Subject: High Power Converters	Subject Code: MELEE1-158	Semester: 1st
Credit: 3	L T P 3 0 0	Duration: 40 Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Learn the characteristics of PSDs such as SCRs, GTOs, IGBTs and use them in practical systems.	3			3	1				3	3	
CO2.	Knowledge of working of multi-level VSIs, DC-DC switched mode converters, Cyclo - Converters and PWM techniques and the ability to use them properly.	3			3	1				3	3	
CO3.	Acquire knowledge of power conditioners and their applications.	3			3	1				3	3	
CO4.	Ability to design power circuit and protection circuit of PSDs and converters	3			2					3	2	

Subject: Wind and Solar Systems	Subject Code: MELEE1-159	Semester: 1st
Credit: 3	L T P 3 0 0	Duration: 40 Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Appreciate the importance of energy growth of the power generation from the renewable energy sources and participate in solving these problems.	3		3						3	3	1
CO2.	Demonstrate the knowledge of the physics of wind power and solar power generation and all associated issues so as to solve practical problems	3		3						3	3	1
CO3.	Demonstrate the knowledge of physics of solar power generation and the associated issues, identify, formulate and solve the problems of energy crises using wind and solar energy	3		3						3	3	1

Subject: Electrical Power Distribution System	**Subject Code: MELEE1-160**	**Semester: 1st**
Credit: 3	**L T P 3 0 0**	**Duration: 40 Hrs.**

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1.	Understand of power distribution system.	3								3						
CO2.	Study of Distribution automation and its application in practice.	3			3					3	3					
CO3.	To learn SCADA system.	3								3	3					

Subject: Optimization Techniques for Power Engineering	**Subject Code: MELEE1-161**	**Semester: 1st**
Credit: 3	**L T P 3 0 0**	**Duration: 40 Hrs.**

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1.	Knowledge about vector spaces, linear transformation, Eigen values and Eigen vectors of linear operators.	3										3				
CO2.	To learn about linear programming problems and understanding the simple method for solving linear programming problems in various fields of science and technology.	3	3									3				
CO3.	Acquire knowledge about nonlinear programming and various techniques used for solving constrained and unconstrained nonlinear programming problems.	3	3									3				
CO4.	Understanding the concept of random variables, functions of random variable and their probability distribution.	3										3				
CO5.	Understand stochastic processes and their classification	3	3									3				

Subject: Pulse Width Modulation for PE Converters	**Subject Code: MELEE1-162**	**Semester: 1st**
Credit: 3	**L T P 3 0 0**	**Duration: 40 Hrs.**

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1.	Appreciate importance of PWM techniques.	3	3							3	2					
CO 2.	Implement PWM using different strategies. .	3			3						3	2				
CO 3.	Control CSI and VSI using PWM.	3			3						3	2				
CO 4.	Compare performance of converter for different PWM techniques		3								2	3				

Subject: Electric and Hybrid Vehicles	**Subject Code: MELEE1-163**	**Semester: 1st**
Credit: 3	**L T P 3 0 0**	**Duration: 40 Hrs.**

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1.	Acquire knowledge about fundamental concepts, principles, analysis and design of hybrid and electric vehicles.	3	3		3					3	3	2				
CO 2.	To learn electric drive in vehicles/traction	3			3	1				3	3					

Subject: English For Research Paper Writing	Subject Code: MHUMA0-101	Semester: 1st
Credit: 0	L T P 2 0 0	Duration: 30 Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1.	Understand that how to improve your writing skills and level of readability	3							3			3				
CO2.	Learn about what to write in each section.	3							3			3				
CO3.	Understand the skills needed when writing a Title Ensure the good quality of paper at very first-time submission	3	3						3			3				

Subject: Disaster Management	Subject Code: MCIVE0-101	Semester: 1st
Credit: 0	L T P 2 0 0	Duration: 30 Hrs.

1.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1.	Learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response.	3	3							3	3					
CO2.	Critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.	3	3	3						3	3					
CO3.	Develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.	3	3							3	3					
CO4.	Critically understand the strengths and weaknesses of disaster management approaches, planning and programming in different countries, particularly their home country or the countries they work in	3	3							3	3					

Subject: Sanskrit for Technical Knowledge	Subject Code: MHUMA0-102	Semester: 1st
Credit: 0	L T P 2 0 0	Duration: 30 Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1.	Understanding basic Sanskrit language.	3							1	3						
CO2.	Ancient Sanskrit literature about science & technology can be understood.	3							1	3						
CO3.	Being a logical language will help to develop logic in students	3			1				1	3						

Subject: Value Education	Subject Code: MHUMA0-103	Semester: 1st
Credit: 0	L T P 2 0 0	Duration: 30 Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1.	Knowledge of self-development.	3								3						
CO 2.	Learn the importance of Human values.	3								3						
CO 3.	Developing the overall personality	3								3						

Subject: Constitution of India	Subject Code: MHUMA0-104	Semester: 1st
Credit: 0	L T P 2 0 0	Duration: 30 Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.	3								3						
CO2	Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India. .	3								3						
CO3.	Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.	3	3							3						
CO4.	Discuss the passage of the Hindu Code Bill of 1956	3								3						

Subject: Pedagogy Studies	Subject Code: MHUMA0-105	Semester: 1st
Credit: 0	L T P 2 0 0	Duration: 30 Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1.	What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?	3								3						
CO2.	What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?	3	3							3	3	1				
CO3.	How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?	3	3		1					3	3	1				

Subject: Stress Management by Yoga	Subject Code: MHUMA0-106	Semester: 1st
Credit: 0	L T P 2 0 0	Duration: 30 Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1.	Develop healthy mind in a healthy body thus improving social health also.	3		1	1					3						
CO2.	Improve efficiency	3		1	1					3						

Subject: Personality Development through Life Enlightenment Skills	**Subject Code: MHUMA0-107**	**Semester: 1st**
Credit: 0	**L T P 2 0 0**	**Duration: 30 Hrs.**

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1.	Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life.	3								3						
CO2.	The person who has studied Geeta will lead the nation and mankind to peace and prosperity.	3								3						
CO3.	Study of Neetishatakam will help in developing versatile personality of students.	3								3						

Subject: Digital Protection of Power System	**Subject Code: MELEE1-205**	**Semester: 2nd**
Credit: 3	**L T P 3 0 0**	**Duration: 40 Hrs.**

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1.	Learn the importance of Digital Relays.	3								3						
CO2.	Apply Mathematical approach towards protection.				3						3					
CO3.	Learn to develop various Protection algorithms.				3						3					

Subject: Power System Dynamics-II	**Subject Code: MELEE1-206**	**Semester: 2nd**
Credit: 3	**L T P 3 0 0**	**Duration: 40 Hrs.**

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1.	Gain valuable insights into the phenomena of power system dynamics including obscure ones.	3									3					
CO2.	Understand the power system stability problem.		3								3					
CO3.	Analyse the stability problems and implement modern control strategies.		3								3					
CO4.	Simulate small signal and large signal stability problems.		2			3					3	2				

Subject: Mini Project	Subject Code: MELEE1-210	Semester: 2nd
Credit: 2	L T P 0 0 4	Duration: Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Define the objective, formulate the problem and prepare an action plan for conducting the investigation.			3								
CO2.	Then perform the required Experiment/Develop a Simulation Model/Solve the Problem/Develop a Design/Explore the feasibility/Conduct a survey etc. depending upon the action plan.			3	3	3						
CO3.	Analyse the results and prepare a written report on the study conducted for presentation to the Department		3						3			
CO4.	Final seminar, as oral presentation before a departmental committee								3			

Subject: Restructured Power Systems	Subject Code: MELEE1-264	Semester: 2nd
Credit: 3	L T P 3 0 0	Duration: 40 Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Describe various types of regulations in power systems.	3								3		
CO2.	Identify the need of regulation and deregulation.		3								3	
CO3.	Define and describe the Technical and Non-technical issues in Deregulated Power Industry. .	3	3							3		
CO4.	Identify and give examples of existing electricity markets	3								3		

Subject: Advanced Digital Signal Processing	Subject Code: MELEE1-265	Semester: 2nd
Credit: 3	L T P 3 0 0	Duration: 40 Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Knowledge about the time domain and frequency domain representations as well analysis of discrete time signals and systems.	3	3							3		
CO2.	Study the design techniques for IIR and FIR filters and their realization structures. Design of optimum FIR and IIR filters.				3						3	2
CO3.	Acquire knowledge about the finite word length effects in implementation of digital filters.	3								3		
CO4.	Knowledge about the various linear signal models and estimation of power spectrum of stationary random signals.	3		3						3		1

Subject: Dynamics of Electrical Machines	Subject Code: MELEE1-266	Semester: 2nd
Credit: 3	L T P 3 0 0	Duration: 40 Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Formulate the electrodynamics equations of all electric machines and analyze the performance characteristics		3		3						3	3
CO2.	Knowledge of transformations for the dynamic analysis of machines	3	3								3	3
CO3.	Knowledge of determination of stability of the machines under small signal and transient conditions	3		3							3	3
CO4.	Study about synchronous machines	3								3		

Subject: Electrical Machine Design	Subject Code: MELEE1-267	Semester: 2nd
Credit: 3	L T P 3 0 0	Duration: 40 Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	To give a systematic approach for modeling and analysis of all rotating machines under both transient and steady state conditions with the dimensions and material used	3	3		3						3	3
CO2.	Ability to model and design transformers, three-phase induction motors and alternator.	3			3						3	3

Subject: Advanced Micro-Controller Based Systems	Subject Code: MELEE1-268	Semester: 2nd
Credit: 3	L T P 3 0 0	Duration: 40 Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	To learn how to program a processor in assembly language and develop an advanced processor based system.	3			3	3					3	2
CO2.	To learn configuring and using different peripherals in a digital system	3			3						3	2
CO3.	To compile and debug a Program	3			3						3	
CO4.	To generate an executable file and use it	3			3						3	

Subject: SCADA System and Applications	Subject Code: MELEE1-269	Semester: 2nd
Credit: 3	L T P 3 0 0	Duration: 40 Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Describe the basic tasks of supervisory control and data acquisition systems (SCADA) as well as their typical applications.	3								3		
CO2.	Acquire knowledge about SCADA architecture, various advantages and disadvantages of each system	3								3		
CO3.	Knowledge about single unified standard architecture IEC 61850	3								3		
CO4.	To learn about SCADA system components: remote terminal units, PLCs, intelligent electronic devices, HMI systems, SCADA server.	3			3	3					3	
CO5.	Learn and understand about SCADA applications in transmission and distribution sector, industries etc	3			3						3	1

Subject: Power Quality	**Subject Code: MELEE1-270**	**Semester: 2nd**
Credit: 3	**L T P 3 0 0**	**Duration: 40 Hrs.**

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Acquire knowledge about the harmonics, harmonic introducing devices and effect of harmonics on system equipment and loads.	3	3	3						3	3	2
CO2.	Develop analytical skills needed for modeling and analysis of harmonics in networks and components		3		3						3	
CO3.	To introduce the students to active power factor correction based on static VAR compensators and their control techniques.			3	3						3	2
CO4.	To introduce the students to series and shunt active power filtering techniques for harmonics.				3						3	2

Subject: Artificial Intelligence Techniques	**Subject Code: MELEE1-271**	**Semester: 2nd**
Credit: 3	**L T P 3 0 0**	**Duration: 40 Hrs.**

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Learn the concepts of biological foundations of artificial neural networks	3								3		
CO2.	Learn Feedback networks and radial basis function networks and fuzzy logics.	3								3		3
CO3.	Identifications of fuzzy and neural networks		3							3		3
CO4.	Acquire the knowledge of GA and EP.	3								3		3

Subject: Major Project (Phase-I) Dissertation	**Subject Code: MELEE1-311**	**Semester: 3rd**
Credit: 10	**L T P 0 0 20**	**Duration: 60 Hrs.**

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Design a meaningful research project that demonstrates spatial thinking and uses the knowledge and skills. .				3							3
CO2.	Define and analyse a problem in latest research areas		3	3							2	3
CO3.	Formulate and write a research proposal.			3					3			3
CO4.	Synopsis and its Presentation								3			3

Subject: Power System Transients	**Subject Code: MELEE1-372**	**Semester: 3rd**
Credit: 3	**L T P 3 0 0**	**Duration: 40 Hrs.**

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Knowledge of various transients that could occur in power system and their mathematical formulation.	3			1						3	
CO2.	Ability to design various protective devices in power system for protecting equipment and personnel	1			3						3	1
CO3.	Coordinating the insulation of various equipment in power system	1			3						3	
CO4.	Modeling the power system for transient analysis.	1	3		3						3	1

Subject: FACTS and Custom Power Devices	**Subject Code: MELEE1-373**	**Semester: 3rd**
Credit: 3	**L T P 3 0 0**	**Duration: 40 Hrs.**

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Acquire knowledge about the fundamental principles of passive and active and reactive power compensation schemes at transmission and distribution level in power systems.	3								3		
CO2.	Learn various Static VAR Compensation Schemes like Thyristor/GTO controlled reactive power systems; PWM inverter based reactive power systems and their controls	3								3		
CO3.	To develop analytical modeling skills needed for modeling and analysis of such Static VAR Systems		3		3						3	1

Subject: Industrial Load Modeling and Control	**Subject Code: MELEE1-374**	**Semester: 3rd**
Credit: 3	**L T P 3 0 0**	**Duration: 40 Hrs.**

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Knowledge about load control techniques in industries and its application. .	3			1					3	3	
CO2.	Learn different types of industrial processes and optimize the process using tools like LINDO and LINGO	3									3	3
CO3.	Apply load management to reduce demand of electricity during peak time				3						3	1
CO4.	Apply different energy saving opportunities in industries				3						3	1

Subject: Dynamics Of Linear Systems	Subject Code: MELEE1-375	Semester: 3rd
Credit: 3	L T P 3 0 0	Duration: 40 Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	To learn linear system modeling, analysis and design so as to obtain the ability to apply the same to engineering problems in a global perspective.	3	3	3	3	1				3	3	2
CO2.	Knowledge on carrying out detailed stability analysis of both linear and nonlinear systems	3	3			1				3	3	2
CO3.	Design observers and controllers for linear systems	3			3	1				3	3	3
CO4.	Acquire knowledge of discrete time linear systems modeling, analysis and design.	3	3	3	3	1				3	3	3
CO5.	Develop and utilize modern software tools for analysis and design of linear continuous and discrete time systems	3	3		3	3				3	3	3

Subject: Business Analytics	Subject Code: MELEE1-391	Semester: 3rd
Credit: 3	L T P 3 0 0	Duration: 40 Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Students will demonstrate knowledge of data analytics.	3	3							3		
CO2.	Students will demonstrate the ability of think critically in making decisions based on data and deep analytics	3	3								3	
CO3.	Students will demonstrate the ability to use technical skills in predicative and prescriptive modeling to support business decision-making.	3			3						3	1

Subject: Operations Research	Subject Code: MELEE1-393	Semester: 3rd
Credit: 3	L T P 3 0 0	Duration: 40 Hrs.

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Students should able to apply the dynamic programming to solve problems of discreet and continuous variables.	1		3								
CO2.	Students should be able to apply the concept of non-linear programming.	1	2	3								
CO3.	Students should able to carry out sensitivity analysis.	1	3									

Subject: **Major Project**	Subject Code: **MELEE1-412**	Semester: **3rd**
Credit: **16**	L T P **0 0 16**	Duration: **Hrs.**

COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1.	Execute a meaningful research project that demonstrates spatial thinking and uses the knowledge and skills.	1	2					3			3	
CO2.	Able to learn effectively record data and experiments so that others can understand them.							3	2		3	3
CO3.	Communicate the findings by means of a thesis, written in the format specified by the department/institute. Each student will be required to complete a Dissertation and submit a written report on the topic on any of the areas of modern technology related to Electrical Engineering including interdisciplinary fields in the final semester of M. Tech Course.								3			3

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30% 2. Moderate (Medium) – above 30% and upto70% 3. Substantial (High) – above 70%