

**Swami Vivekanand Subharti University,  
Meerut**

*Subharti Institute of Engineering & Technology*

Department of Electrical and Electronics Engineering

**(ODD SEMESTER)**

## **Program Education Objectives (PEOs)**

### **PEO-1**

To prepare graduates who will be successful professionals in industry, government, academia, research, entrepreneurial pursuit and consulting firms

### **PEO-2**

To prepare graduates who will contribute to society as broadly educated, expressive, ethical and responsible citizens with proven expertise.

### **PEO-3**

To prepare graduates who will achieve peer-recognition; as an individual or in a team; through demonstration of good analytical, design and implementation skills

### **PEO-4**

To prepare graduates who will thrive to pursue life-long learning to fulfill their goals.

## **Program Outcomes (POs)**

### **PO 1**

**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

### **PO 2**

**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

### **PO 3**

**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**PO 4**

**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO 5**

**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

**PO 6**

**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO 7**

**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO 8**

**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO 9**

**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO 10**

**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**PO 11**

**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**PO 12**

**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**Programme Specific Objectives:****PSO 1**

Able to apply the knowledge gained during the course of the program from Mathematics, Basic Computing, Basic Sciences and Social Sciences in general and all electrical courses in particular to identify, formulate and solve real life problems faced in industries and/or during research work.

**PSO 2**

Able to provide socially acceptable technical solutions to complex electrical engineering problems with the application of modern and appropriate techniques for sustainable development

**PSO 3**

Able to apply the knowledge of ethical and management principles required to work in a team as well as to lead a team.

**Subject Name: ELECTRIC DRIVES SYSTEM (MPED-101)**

**Course Outcomes (COs)**

- CO-1 Model and simulate electric drive systems.
- CO-2 Design and modulation strategies of power electronics converters, for drives applications
- CO-3 Design appropriate current/voltage regulators for electric drives.
- CO-4 Select and implement the drives for industrial process.
- CO-5 Implement various variable speed drives in electrical energy conversion system.

**Subject Name: MODELLING & ANALYSIS OF ELECTRICAL MACHINES (MPED-102)**

**Course Outcomes (COs)**

- CO-1 Knowledge about the dynamic behavior rotating machines
- CO-2 Able to understand equivalent circuit of synchronous machines
- CO-3 To understand various practical issues of different machines

**Subject Name: POWER QUALITY (MPED- 113)**

**Course Outcomes (COs)**

- CO-1 Understand the basic Power quality measures and standards.
- CO-2 Understand the Harmonics and total harmonic distortion.
- CO-3 Analyze Transmission and distribution systems by Modeling networks and components under non-sinusoidal conditions
- CO-4 Understand the different Power factor improvement methodologies - Passive Compensation, Passive Filtering & Harmonic Resonance.
- CO-5 Analyze by Design and simulation of variable structure adaptive model & model reference adaptive Systems (MRAS).

**Subject Name: STATIC VAR CONTROLLER AND HARMONIC FILTERING  
(MPED-121)**

**Course Outcomes (COs)**

- CO-1 Acquired knowledge about the fundamental principles of Passive and Active Reactive Power Compensation Schemes at Transmission and Distribution level in Power Systems.
- CO-2 Able to understand the various power quality Issues.
- CO-3 Able to understand & analytical modeling skills of various single phase and three-phase Static VAR Compensation schemes and their controls.
- CO-4 Able to understand and analysis of static compensators, Harmonics and filtering

**Subject Name: ELECTRICAL DRIVES LAB (MPED-151)**

**Course Outcomes (COs)**

- CO-1 Ability to formulate, Design, simulate power supplies for generic load and for machine loads.
- CO-2 Ability to optimally design magnetic required in power supplies and drive systems.
- CO-3 Ability to conduct harmonic analysis and load tests on power supplies and drive systems

**Subject Name: ELECTRICAL MACHINE LAB (MPED-152)**

**Course Outcomes (COs)**

- CO-1 Understand the concept of efficiency and the short circuit impedance of a three-phase transformer from no-load test, winding resistance, short circuit test, and load test.
- CO-2 Acquire knowledge about the constructional details and principle of operation of dc machines
- CO-3 Acquire knowledge about the working of dc machines as generators and motors.
- CO-4 Acquire knowledge about the constructional details, principle of operation, testing and applications of transformers

**Subject Name: Research Methodology and IPR (METC-101)**

**Course Outcomes (COs)**

- CO-1 Understand research problem formulation.
- CO-2 Analyze research related information
- CO-3 Follow research ethics
- CO-4 Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity
- CO-5 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.
- CO-6 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.

**Subject Name: ENGLISH FOR RESEARCH PAPER WRITING (METC-111)**

**Course Outcomes (COs)**

- CO-1 Improve their writing skills and level of readability.
- CO-2 Learn about what to read /write in each section
- CO-3 Learn about key skills needed when writing a title ensure the good quality of paper at very first time submission.
- CO-4 Learn methods and skills when writing the results, discussions, and conclusions

**Subject Name: POWER ELECTRONIC CONVERTER (MPED-201)**

**Course Outcomes (COs)**

- CO-1 To give a systematic approach for transient and steady state analysis of all power electronic converters with passive and active loads
- CO-2 To know and carry out transient and steady state analysis of different power converters of different types of loads and switching sequences
- CO-3 To learn how to analyze the converters and design the components of them, under various load types
- CO-4 To learn about the control of various converters
- CO-5 Acquire detailed knowledge of designing the various converters.



**Subject Name: Digital Control of Power Electronic and Drive Systems (MPED-202)**  
**(EVEN SEM)**

**Course Outcomes (COs)**

- CO-1 Understand different control strategies.
- CO-2 Understand state space modeling of different converters.
- CO-3 Perform simulation of different power converters
- CO-4 Provides knowledge on modeling and simulation of power simulation circuits and systems
- CO-5 Simulate power electronic systems and analyze the system response.

**Subject Name: INDUSTRIAL LOAD MODELLING AND CONTROL (MPED-212) (EVEN SEM)**

**Course Outcomes (COs)**

- CO-1 To understand the energy demand scenario.
- CO-2 To understand the modeling of load and its ease to study load demand industrially
- CO-3 To know Electricity pricing models.
- CO-4 Study Reactive power management in Industries.

**Subject Name: SMARTS GRID (MPED-243)**

**Course Outcomes (COs)**

- CO-1 Appreciate the difference between smart grid & conventional grid.
- CO-2 Apply smart metering concepts to industrial and commercial installations.
- CO-3 Formulate solutions in the areas of smart substations, distributed generation and wide area measurements
- CO-4 Come up with smart grid solutions using modern communication technologies.

## **Subject Name: Power Electronics LAB (MPED-252)**

### **COURSE OUTCOME:**

CO1: Determine & analyse the characteristics of rectifiers, SCR, AC voltage controllers and inverter circuits.

CO2: Determine the performance of cyclo-converters etc.

CO3: Design the control circuit and the power circuit for AC-DC converters & analyse their performance

CO4: Understand the concepts of triggering of devices used in circuits.

## **Subject Name: MICROCONTROLLER LAB (MPED-253)**

### **Course Outcomes (COs)**

CO-1 Understanding the instruction set of various microprocessors.

CO-2 Understanding the basic concepts of machine languages.

CO-3 Conversion of various number systems

CO-4 Execution of several basic programmes

**Subject Name: CONSTITUTION OF INDIA (METC-215)**

**Course Outcomes (COs)**

- CO-1 Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
- CO-2 Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
- CO-3 To study about the basic concepts of Liberty, Equality, Rights, Duties, Law and Justice
- CO-4 To study about the different organs of Governance
- CO-5 Analyze the working of local Administration and Election commission.

**M. Tech (PED)**

**3<sup>RD</sup> SEMESTER**

**Subject Name: FACTS AND CUSTOM POWER DEVICES**

**Subject code: MPED-312**

**Course Outcomes (COs)**

- CO-1 To acquire knowledge about the fundamental principles of Passive and Active Reactive Power Compensation Schemes at Transmission and Distribution level in Power Systems.
- CO-2 To learn various Static VAR Compensation Schemes like Thyristor/GTO Controlled
- CO-3 To Reactive Power Systems, PWM Inverter based Reactive Power Systems and their controls.
- CO-4 To To develop analytical modeling skills needed for modeling and analysis of such Static VAR Systems