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Sanstha's  
**Mauli Group of Institutions**  
College of Engineering & Technology, Shegaon

Department of Electrical (Electronics and Power) Engineering

B.E. 7<sup>th</sup> Sem

Course: Power System-II

Course Code: (7EP01)

At the end of **Power System-II** course the student will be able to:

CO No.	Course Outcome	Level of Learning ( as per Bloom`s Taxonomy)
1	Explain the basic Concept of Fault Analysis in Electrical systems.	L2
2	Transform the unsymmetrical components into symmetrical components and to form sequence networks of power system elements.	L4
3	Analyze the different types of symmetrical and Unsymmetrical Faults in Electric Power System.	L4
4	Analyze different types of unsymmetrical faults using symmetrical components.	L4
5	Analyze the steady state stability of the system.	L4
6	Assess transient state stability of two machine systems.	L5

Course: Digital Signal Processing

Course Code: (7EP02)

At the end of **Digital Signal Processing** course the student will be able to:

CO No.	Course Outcome	Level of Learning ( as per Bloom`s Taxonomy)
1	Analyze the discrete time signals in time domain.	L4
2	Analyze the discrete time systems using DTFT and DFT.	L4
3	Apply the concept of Band pass sampling.	L3
4	Design the structures of different types of digital filters.	L6
5	Analyze the frequency response of various digital filters.	L4
6	Apply the knowledge of multi-rate signal processing	L3

**Course: Entrepreneurship and Project Management****Course Code: (7EP03)**At the end of **Entrepreneurship and Project Management** course the student will be able to:

<b>CO No.</b>	<b>Course Outcome</b>	<b>Level of Learning ( as per Bloom`s Taxonomy)</b>
1	Understand the concept of entrepreneurship and its role in economic development.	L2
2	Explain the skill required for entrepreneurs.	L2
3	Compare the various business models and select the most suitable.	L4
4	Formulate the project report and Source of finance for a project.	L6
5	Identification & evaluation of project reports of various types.	L4
6	Estimate the cost, time & resources for the project work.	L5

**Course: Power System Operation and Control (PE-III)****Course Code: (7EP04)**At the end of **Power System Operation and Control** course the student will be able to:

<b>CO No.</b>	<b>Course Outcome</b>	<b>Level of Learning ( as per Bloom`s Taxonomy)</b>
1	Summarize the knowledge of preliminaries on power system operation and control.	L5
2	Determine the optimal scheduling of generation for a two-plant system with and without losses for the economic operation of the power system.	L5
3	Develop the mathematical model of the Automatic Load-Frequency Control(ALFC) loop and the Automatic Voltage Regulator (AVR) loop.	L6
4	Evaluate the Automatic generation control and transfer function modeling of Automatic Load Frequency Control (ALFC) and its different components	L5
5	Explain the concepts of Control Area, Pool operation; Tie-line Modeling, Tie-line bias control, and to discuss Static and Dynamic response of ALFC loop.	L2
6	Explain the role of the power system stabilizer in damping the steady-state oscillations set up in the power system	L2

**Course: Distributed Automation (PE-IV)**

**Course Code: (7EP05)**

At the end of **Distributed Automation (PE-IV)** course the student will be **able to:**

<b>CO No.</b>	<b>Course Outcome</b>	<b>Level of Learning ( as per Bloom`s Taxonomy)</b>
1	Summarize distribution system planning and automation.	L5
2	Explain appropriate communication technology for SCADA applied to distribution automation.	L2
3	Demonstrate the knowledge of substation automation.	L3
4	Improve the voltage profile of distribution feeder using distribution automation.	L6
5	Explain the concept of remote metering.	L2
6	Select the appropriate type of energy management.	L5

## **LAB OUTCOME**

**Course: Power System-II-LAB**

**Course Code: (7EP06)**

At the end of **Power System-II-LAB** course the student will be **able to:**

<b>LO No.</b>	<b>Course Outcome</b>	<b>Level of Learning ( as per Bloom`s Taxonomy)</b>
1	Determine $X_d$ and $X_q$ by slip test	L5
2	Determine $X_d'$ and $X_q'$ by sudden symmetrical short circuit test.	L5
3	Analyze symmetrical and unsymmetrical faults	L4

**Course: Digital Signal Processing-LAB**

**Course Code: (7EP07)**

At the end of **Digital Signal Processing-LAB** course the student will be **able to:**

<b>LO No.</b>	<b>Course Outcome</b>	<b>Level of Learning ( as per Bloom`s Taxonomy)</b>
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1	Generate various continuous and Discrete Signal in MATLAB	L6
2	Design various types of filters in MATLAB	L6
3	Verify Sampling Theorem.	L5

**Course: Entrepreneurship and Project Management-LAB**

**Course Code: (7EP08)**

At the end of **Entrepreneurship and Project Management-LAB** course the student will be able to:

<b>LO No.</b>	<b>Course Outcome</b>	<b>Level of Learning ( as per Bloom`s Taxonomy)</b>
1	Use SWOT Analysis for business.	L3
2	Arrange discussion session with Entrepreneurs	L6
3	Prepare a report of technological and Financial Feasibility of product.	L6

**Course: Project and Seminar**

**Course Code: (7EP09)**

At the end of **Project and Seminar** course the student will be able to:

<b>LO No.</b>	<b>Course Outcome</b>	<b>Level of Learning ( as per Bloom`s Taxonomy)</b>
1	Analyze a topic assigned to them	L4
2	Prepare the report of selected topic.	L6
3	Explain assigned topic.	L2

**B.E. 8<sup>th</sup> Sem**

**Course: Power System Protection**

**Course Code: (8EP01)**

At the end of **Power System Protection** course the student will be **able to**:

<b>CO No.</b>	<b>Course Outcome</b>	<b>Level of Learning ( as per Bloom`s Taxonomy)</b>
1	Explain the need, desirable features & main components of protection system.	L2
2	Design the various protection scheme for transmission line.	L6
3	Develop the protection scheme for Alternator, Transformer, and Motors & Busbar.	L6
4	Demonstrate the knowledge of static relays & Numerical relays.	L3
5	Explain Construction, operation & application of fuses.	L2
6	Select the proper type & rating of circuit breaker and fuses for various application.	L5

**Course: Computer Methods in Power System Analysis**

**Course Code: (8EP02)**

At the end of **Computer Methods in Power System Analysis** course the student will be **able to**:

<b>CO No.</b>	<b>Course Outcome</b>	<b>Level of Learning ( as per Bloom`s Taxonomy)</b>
1	Develop mathematical model to represent the power system components for computerized analysis.	L6
2	Demonstrate the topology of electrical power system.	L3
3	Formulate Zbus & Ybus by algorithm.	L6
4	Analyze short circuit studies of electrical power system.	L4
5	Analyze load flow studies of electrical power system.	L4
6	Examine stability studies of electrical power system.	L4

**Course: Smart Grid System (PE-V)****Course Code: (8EP03)**At the end of **Smart Grid System (PE-V)** course the student will be **able to:**

<b>CO No.</b>	<b>Course Outcome</b>	<b>Level of Learning ( as per Bloom`s Taxonomy)</b>
1	Explain the features, necessity and architecture of Smart Grid.	L2
2	Relate the role of Automation in Transmission and Distribution.	L4
3	Explain different measuring methods and sensors used in Smart Grid	L2
4	Interpret the role of batteries and energy storages in Smart Grid.	L5
5	Discuss Power Quality issues in Smart Grid	L2
6	Elaborate the role of communication and networking in Smart Grid.	L2

**Course: Power Quality (PE-VI)****Course Code: (8EP04)**At the end of **Power Quality (PE-VI)** course the student will be **able to:**

<b>CO No.</b>	<b>Course Outcome</b>	<b>Level of Learning ( as per Bloom`s Taxonomy)</b>
1	Explain the concept, need, and standards of Power Quality	L2
2	Classify Power quality characteristics.	L4
3	Explain Power Quality Standards.	L2
4	Explain Power Quality Solution Reduce Effects on Sensitive Equipment	L2
5	Explain Wiring and Grounding Principles.	L2
6	Use of measurement tools for power quality survey.	L3

# LAB OUTCOME

**Course: Power System Protection-LAB**

**Course Code: (8EP05)**

At the end of **Power System Protection-LAB** course the student will be **able to:**

LO No.	Course Outcome	Level of Learning ( as per Bloom`s Taxonomy)
1	Explain the need, desirable features & main components of protection system.	L2
2	Design the various protection scheme for transmission line.	L6
3	Develop the protection scheme for Alternator, Transformer, and Motors & Busbar.	L6

**Course: Computer Methods in Power System Analysis -LAB**

**Course Code: (8EP06)**

At the end of **Computer Methods in Power System Analysis-LAB** course the student will be **able to:**

LO No.	Course Outcome	Level of Learning ( as per Bloom`s Taxonomy)
1	Develop a program for Y Bus and Z Bus Matrix using Singular Transformation and Step by step algorithm.	L6
2	Design a program for Load Flow study using Gauss Seidal method, Newton Raphson method and Fast Decoupled method.	L6
3	Develop a program for Short Circuit study for LLL fault and LLL-G fault.	L6

**Course: Project and Seminar**

**Course Code: (8EP07)**

At the end of **Project and Seminar** course the student will be **able to:**

LO No.	Course Outcome	Level of Learning ( as per Bloom`s Taxonomy)
1	Design a project of Electrical Engineering.	L6
2	Develop a Project report on finalized topic.	L6
3	Defend a project work	L5