

Lesson Plan using LLM

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Course Title: Distributed Generation and Micro-Grids (22EE2264)

Program: M.Tech. in Power Electronics & Drives

Lesson Plan, Assessments, and Experiential Learning Activities

This document outlines unit-wise lesson plans, assessments, and experiential learning activities to achieve the course outcomes specified in the syllabus.

UNIT I: Introduction to Distributed Generation

Learning Outcomes:

Differentiate Distributed and Traditional power generation (L2)

Explain DG planning (L2)

Compare DG systems (L5)

Lesson Plan:

Week	Topic	Method	Tools
1	Introduction to DG vs Central Generation	Lecture,	Discussion Grid diagrams
2	Cost of T&D Systems	Case Analysis	Cost sheets
3	DG Planning Methods	Group Activity	Planning templates
4	Comparison of DG Systems	Debate/Peer Teaching	Posters/charts

Assessments:

Quiz on basic concepts (L2)

Assignment: Compare two DG types (L5)

Proposal: DG setup for a remote site (L2, L5)

Experiential Learning: Survey/local literature review on DG installations /

Simulation of DG system using Excel/HOMER

UNIT II: Types of Distributed Generators

Learning Outcomes:

Summarize renewable-based DGs (L2)

Discuss fuel cells and turbines (L2)

Explain grid interconnection types (L2)

Lesson Plan:

Week	Topic	Method	Tools
5	Solar & Wind DGs	Lecture	Videos, data sheets
6	Fuel Cells & Gas Turbines	Chalk Talk	Case studies
7	Grid Interconnection	Group Activity	Topology diagrams

Assessments:

Quiz: Types and working of DGs (L2)

Assignment: Summary table of DG features

Activity: Map DG types to regions

Experiential Learning:

Layout design for rooftop solar

UNIT III: Energy Storage Systems

Learning Outcomes:

Explain storage devices (L2)

Illustrate SMES concepts (L3)

Compare energy storage technologies (L5)

Lesson Plan:

Week	Topic	Method	Tools
8	Battery, SMES, Capacitors	Demo	Circuit models
9	Mechanical Storage	Lecture	Real-world examples
10	Storage Tech Comparison	Group Activity	Evaluation matrix

Assessments:

Viva on any storage tech (L2)

Quiz: Match storage type to use-case (L3)

Project: Evaluate 3 storage options (L5)

Experiential Learning:

Case Study: Tesla vs Traditional batteries

Data Analysis: 24-hr storage sizing

UNIT IV: Micro-Grids – I**Learning Outcomes:**

Explain types of microgrids (L2)

Summarize AC vs DC microgrids (L5)

Interface microgrids with PE units (L4)

Week	Topic	Method	Tools
11	Microgrid Basics	Map Creation	
12	AC vs DC Microgrids	Group Discussion	Matrix charts
13	PE Interfaces	Lab Demo	Simulation tools

Assessments:

Assignment: AC vs DC Microgrid table (L5)

Simulation: Grid-tied microgrid model (L4)

Quiz: Microgrid configs (L2)

Experiential Learning:

Simulation: Load variation impact on microgrids

UNIT V: Micro-Grids – II

Learning Outcomes:

Apply DC Microgrid operations (L3)

Discuss control methods (L2)

Explain stability systems (L2)

Week	Topic	Method	Tools
14	DC Microgrid Components	Peer Instruction	Grid map
15	Control Methods	Problem Solving	Block diagrams
16	Stability Systems	Case Study	Sim tools

Assessments:

Project: Design control for DC microgrid (L3)

Assignment: Paper on DC microgrid standards (L2)

Simulation: Fault analysis in DC grid (L2)

Experiential Learning:

Case Challenge: DC grid failure recovery

Simulation using PSCAD/Simulink