**Lesson Plan using LLM**

**Name: Dr .C.V.K.Bhanu**

**Email: bhnaucvk@gvpce.ac.in**

**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