



MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY JAIPUR

Online Faculty Development Programme



Jointly Organized by Electronics & ICT Academy MNIT Jaipur, IIT Roorkee, IIITDM Jabalpur, NIT Patna
on

Fundamentals of Smart Grid

(7th July – 1st August 2025)

Instructor – Prof. N. P. Padhy, Director, MNIT Jaipur

Day	Lecture	Time 17:00-19:00
1	07.07.2025 Monday	• Inaugural and overview of the FDP (17:00-17:30)
		• Introduction to Smart Grid-I • Introduction to Smart Grid-II
2	08.07.2025 Tuesday	• Introduction to Energy Storage Devices • Different Types of Energy Storage Technologies
3	09.07.2025 Wednesday	• Analytical Modelling of Energy Storage Devices • Optimal Sizing and Siting of Storages
4	10.07.2025 Thursday	• Battery Management System (BMS) • Modelling of DC Smart Grid Components
5	11.07.2025 Friday	• Modelling of Storage Devices • Operation and Control of AC Microgrid-I
6	14.07.2025 Monday	• Operation and Control of AC Microgrid-II • Operation and Control of DC Microgrid -I
7	15.07.2025 Tuesday	• Operation and Control of DC Microgrid-II • Operation and Control of AC- DC Hybrid Microgrid-I
8	16.07.2025 Wednesday	• Operation and Control of AC- DC Hybrid Microgrid-II • Phasor Measurement Unit (PMU) Placement
9	17.07.2025 Thursday	• Cyber Security and Resiliency • Virtual Inertia and Ancillary Support
10	18.07.2025 Friday	• Demand Side Management in Smart Grid • Demand Response Analysis of Smart Grid
		• Quiz 1
11	21.07.2025 Monday	• Demonstration of Solar Power Generation • Demonstration of Wind Power Generation
12	22.07.2025 Tuesday	• Demonstration of Battery Management System (BMS) • Demonstration of EV Charging System
13	23.07.2025 Wednesday	• Hierarchical Control Techniques in Hybrid AC-DC Microgrid • Simulation and Case Study of AC Microgrid
14	24.07.2025 Thursday	• Simulation and Case Study of DC Microgrid • Harmonic Effects and its Mitigation Techniques
15	25.07.2025 Friday	• Simulation and Case Study of AC-DC Hybrid Microgrid
16	28.07.2025 Monday	• Demonstration of Parallel Inverter Operation in AC Microgrid • Energy Management
17	29.07.2025 Tuesday	• Design of Smart Grid and Practical Smart Grid Case Study – I, II • System Analysis of AC/DC Smart Grid
18	30.07.2025 Wednesday	• Demonstration of Grid-Connected DC Microgrid • Demonstration of Energy Management in DC Microgrid
19	31.07.2025 Thursday	• Demonstration of PHIL Experimentation for Symmetric and Asymmetric Fault Analysis of Grid-Connected DFIG Wind Turbine. • Demonstration of Ancillary Support from Virtual Synchronous Generator
		• Quiz 2
20	01.08.2025 Friday	• Demonstration on Peak Energy Management using Storage • Conclusions
		• Feedback and Valediction