



Pandit Deendayal Petroleum University (PDU), Gandhinagar

School of Technology

Department of Electrical Engineering

M.Tech in Electrical Engineering (Power Systems)

About the Program

Delivery of sustainable, reliable, low-carbon and affordable energy is one of the biggest global challenge in recent times. The dependency on fossil fuels and the global climate challenge require an urgent technological transformation across all parts of the electric energy system. The existing conventional electric grid requires redesigning and restructuring to transform into smart user-interactive grid. The novel grid will be capable to integrate renewable power generation, energy storage devices and electric vehicles into electrical transmission and distribution systems. The major objective of M. Tech program with specialization in Power Systems is to prepare students for a new era of truly 'smart' grids, and is designed to meet the urgent need for specialists in advanced electrical energy systems. The curriculum of M. Tech program is grouped into following thrust areas:

- Power System Analysis, Dynamics and Protection
- Power Quality, Power Electronics Converters, Power Electronics Applications to Energy Systems
- Smart Grid, Energy Infrastructure, E-Mobility, Energy Storage
- Renewable Energy Integration, Energy Market

M. Tech programme with specialization in Power Systems aims to equip the students with:

- Systematic understanding of techniques applicable to research and a critical awareness of current problems along with new insights that are at the forefront of Electrical Energy Systems.
- Demonstrable mastery in operation, control and protection of emerging smart grid
- Skill to develop hardware projects related to active filters, inverter-interfaced power generation, FACTS, HVDC, electric vehicles propulsion and battery management system
- Ability to critically investigate the prevailing complex power system scenarios and arrive at possible solutions by applying the acquired theoretical and practical knowledge
- Potential to be key professionals in Electrical Energy and Power domain

The salient features of the programme include:

- The opportunities to learn in a research-led teaching institution
- The students will undertake project work in a research environment under the supervision of research-intensive faculties
- Curriculum designed by research-oriented faculties and leading professionals working in industries
- Emphasis on acquisition of practical skills through simulation and hardware projects
- Availability of globally recognized licensed software such as ETAP, PSCAD, MiPower, PSIM, MATLAB and real time implementation platforms such as dSPACE microlab box.

- An open and engaging culture between students and faculty staff
- Emphasis on progression towards independent learning which prepares the students for career in research & development in India and abroad

Who is eligible to apply?

- B.E. /B. Tech. in Electrical Engineering/Electrical and Electronics (Power System)/Electrical and Electronics Engineering/Electrical and Instrumentation Engineering/Electrical and Power Engineering/ Electrical Engineering (Electronics and Power)/Electrical, Electronics and Power, with minimum 60% or CPI/CGPA of 6.5 on a 10 point scale.

About Curriculum

The curriculum is designed to provide a deep insight and knowledge, which qualifies the graduate to analyse, design, develop and operate electric energy systems. The program demands the pre-requisite on fundamental knowledge of circuit analysis, power system, electric machines and power electronics. The curriculum of M. Tech program is structured in following three categories:

- **Core Courses:** The core courses are required for strong theoretical foundation and they cover broad aspects of power system engineering, power electronics, control system engineering and smart grid.
- **Elective Courses:** The elective courses are focused on emerging areas of energy infrastructure, smart grid control and renewable energy integration.
- **Project and Dissertation:** Students will undertake a full year project and dissertation work under mentorship of faculties focused on research and can also opt for a full year industrial project. Students graduating the programme will have the capability to apply fundamental laws and advanced power system concepts to solve research and industrial problem.

Associated Laboratories

- Modeling and Simulation Lab.: ETAP, PSCAD, MiPower, MATLAB, PSIM.
- Power Electronics and Drives:
- Modern Processors and Embedded Systems Lab.
- Advanced Power System Protection Lab.
- Electrical Machines and Renewable Energy Lab.
- Process Dynamics and Control Lab.