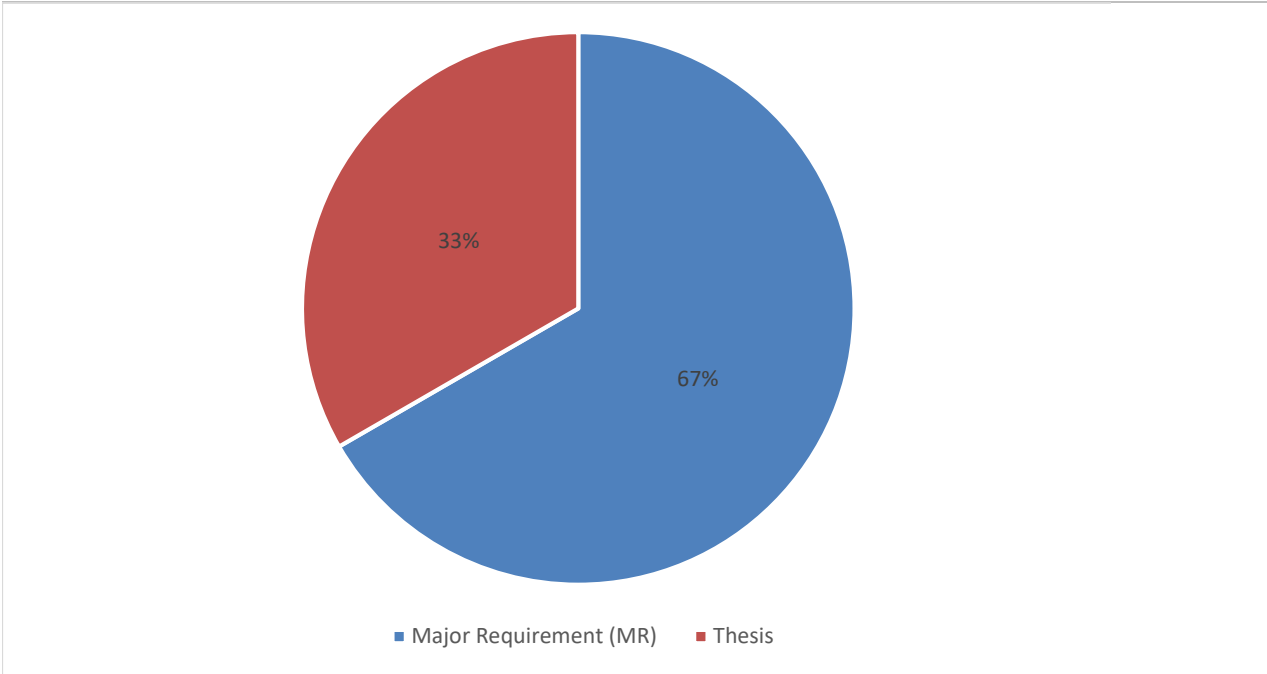


Master of Science Program in Power Systems Engineering 2025

The Power Systems Engineering 2025 M.Sc. Program for Batch 2025 Onwards

Program Components



Course Type	Credit Hours	No. of Courses
University Requirements (UR)	0	0
College Requirements (CR)	0	0
Major Requirement (MR)	24	6
Major Support Requirement (MSR)	0	0
Major Elective (ME)	0	0
Training (Internship, Practicum) (TR)	0	0
Thesis	12	1
Total Number of Credit Hours	36	
Total Number of Courses	7	

Detailed Study Plan

Year 1 - Semester 1

Course Code	Course Title	Course Hours			Course Type	Pre-requisite	Major CGPA	Final Exam (YES/NO)	Department Offering
		LEC	PRAC	CRD					
REE601	Renewable Energy Systems Fundamentals	4	0	4	MR		YES	YES	Electrical and Electronics
PSE601	Advanced Power Systems Engineering	4	0	4	MR		YES	YES	Electrical and Electronics
PSE602	Power Electronics Applications in Power Systems	4	0	4	MR		YES	YES	Electrical and Electronics
	Total	12	0	12					

Year 1 - Semester 2

Course Code	Course Title	Course Hours			Course Type	Pre-requisite	Major CGPA	Final Exam (YES/NO)	Department Offering
		LEC	PRAC	CRD					
PSE603	Power Systems Operations and Optimization Techniques	4	0	4	MR		YES	YES	Electrical and Electronics
PSE604	Stability and Control of Electric Power Systems	4	0	4	MR		YES	YES	Electrical and Electronics
PSE605	Special Topics in Power Systems Engineering	4	0	4	MR		YES	YES	Electrical and Electronics
	Total	12	0	12					

Year 2 - Semester 3 and 4

Course Code	Course Title	Course Hours			Course Type	Pre-requisite	Major CGPA	Final Exam (YES/NO)	Department Offering
		LEC	PRAC	CRD					
PSE699	Thesis	0	36	12	MR	Completion of 20 Credits	NO	Thesis Defense	Electrical and Electronics

Total		24	36	36					
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Course Description

Major Requirement Courses Descriptions (MR):

Course Code:	REE601	Course Title:	Renewable Energy Systems Fundamentals
Course Description:	Gaining an understanding of the principles of renewable energy technologies is key to understanding the technological basis of the systems and their applications. This is particularly important with regards to the overall energy mix of a specific country. This course provides you with the fundamentals of renewable energy technologies and their impact on global and national energy systems. The purpose of this course is to introduce the basis for assessment of the performances of solar, wind, wave and tidal, hydro-electricity, biomass and waste technologies, and geothermal technologies. Basic introduction to the relevant market and financial management, policies, regulations and incentives will be experienced.		

Course Code:	PSE601	Course Title:	Advanced Power Systems Engineering
Course Description:	This course provides advanced tools for the analysis and design of power systems. Topics include: Incidence and network matrices; Programming considerations: Sparsity programming and triangular factorization; Optimal power flow studies: feasibility, convergence and ill conditioning in large networks, advance solution techniques; Control of real and reactive power flows; Study of faults in large power system networks: symmetrical and asymmetrical faults, short and open circuit faults.		

Course Code:	PSE602	Course Title:	Power Electronics Applications in Power Systems
Course Description:	This course provides advanced methods for the analysis and design of power electronic converters suitable for AC/DC, DC/DC and DC/AC electrical energy conversions including resonance converters. The application of power electronic converters in the fields of sustainable energy technologies such as wind energy, solar power, wave energy, and fuel cells are described in depth. Furthermore, industrial applications like Switch-Mode Power Supplies (SMPSs), Uninterruptible Power Supplies (UPSs), and induction heating as well as application of power electronics for transmission (FACTS), distribution (DFACTS) and control in the future power system, including Smart Grid, are extensively analysed.		

Course Code:	PSE603	Course Title:	Power System Operations and Optimization Techniques
Course Description:	This Course provides an advanced knowledge related to the way the power industry market is run from an economic perspective. It will cover the following broad topics in depth: optimization and optimal economic system operation. Load forecasting and generation scheduling. Nonlinear optimization and economic dispatch problem. Necessary and sufficient conditions for global optimality. Unit commitment. Optimal power flow and Long-term optimization of power systems. Contingency analysis. Concepts of power system security.		

Course Code:	PSE604	Course Title:	Stability and Control of Electric Power Systems
Course Description:	The course provides advanced knowledge about stability problems and dynamic mechanisms in electric power systems. Dynamic modeling, stability analysis, and control of multi-machine power systems. Single machine dynamic modeling, multi-machine dynamic modeling, network differential-algebraic equations and solution methods, small-signal stability analysis, and design of power system stabilizers. Different control algorithms for improving power system stability.		

Course Code:	PSE605	Course Title:	Special Topics in Power Systems Engineering
Course Description:	This course covers a range of specialized topics that can vary based on current industry developments and faculty expertise. The course is designed to provide students with the opportunity to explore cutting-edge advancements and gain deeper insights into areas of interest within power systems engineering. Some of the potential topics include, but not limited to: Smart-Grids in Sustainable Energy Systems, Design of Electrical Machines, Advanced Electric Drives, Power Systems Digital Protection, Linear and Nonlinear Control Systems, Power Systems Reliability and Quality of Supply, Power System Economics and Electricity Markets.		

Course Code:	PSE699	Course Title:	Master's Thesis
Course Description:	The last semester of the Master program provides the student with an opportunity to undertake extensive investigation of an advanced or specialized topic relating to his/her MSc program; to provide the opportunity to plan and execute a significant project of research, investigation or development.		