Proposal for M.Tech. ECE (Power and Control)

Preamble:

Electrical power is the most convenient form of energy that has become the necessity of modern industry and integral part of individual's life. Control system has played key role in automation in the industrial, commercial and domestic segments, which has made the human lifestyle more comfortable and efficient.

Smart grid is the recent concept that aims to utilize the developments in the field of Control Systems, Power Electronics, Information Technology and Communication Systems for more reliable supply of power, peak load adjustment, efficient use of environment-friendly renewable energy sources and consumer satisfaction. Further, Intelligent Control is a cutting edge research area catching up rapidly with multi-dimensional applications in medical, defense, power, manufacturing, etc.

Having the core theme of *IT-enabled design and manufacturing* and remarkable emphasis on *multidisciplinary academic environment*, the PDPM IIITDM Jabalpur requires a program that can support many initiatives of the Govt. of India on power industry reforms, industrial developments, bio-medical instrumentation, etc.

A post graduate program in power, control and automation is proposed in our curriculum that will certainly compliment in realizing our vision and mission. This program will integrate the power system, power electronics, electric dries, control system and automation fields to produce engineers and researcher, who can handle the existing and future challenges in design, commissioning, operation and maintenance of automatic industrial system and equipments.

Motivation

Now a day, almost all of the industrial processes and manufacturing units are operated in automatic mode. Electrical power is the prime energy source in every industry with modern control systems. The industries are always in need of trained manpower with in-depth knowledge of power, control and automation. Further, with the reforms in power industry across the globe, and commitment for establishing smart grid, the requirement of specialization like *power, control and automation* has become even more essential.

In the last few years, a lot of emphasis has been given on the study and research of power, control and automation in esteemed organizations and prestigious universities because of high demand. In the present scenario, inclusion of the proposed program in the curriculum will provide competitive advantage and strength to our institute.

Objectives

Proposed M.Tech. in Power, Control and Automation provides an opportunity for students to develop a project oriented, hands-on training experience in power and control as demanded by the industry. This will help to fulfil the goal towards the design of products and services needed for the automation in Industry.

Eligibility for Admission

Candidates with a Bachelor's Degree in Electrical Engineering, Electrical and Electronics engineering, Electronics and Communication Engineering or equivalent are eligible for this M.Tech. in Power, Control and Automation programme.

Course Structure

Semester I		
S.No.	**Course Title**	**Credits**
1.	Professional and Communication Skills (compulsory)	1-0-2-2
2.	EC521: Special topics in Power and Control Systems (core1)	3-0-0-4
3.	EC522: Power Electronics and Drives (core2)	3-0-0-4
4.	PLC and Microcontroller (Core3)	2-0-4-5
5.	Elective 1	3-0-0-4
	Lab is attached to course Core3	
Semester II		
1.	EC523: System Design: Power and Control (core4)	3-0-2-5
2.	Elective 2	3-0-0-4
3.	Elective 3	3-0-0-4
4.	Thesis	3-0-0-4
	Lab is attached to course core3	
Semester III		
1.	Graduate Seminar I	0-0-3-2
2.	M.Tech. Dissertation	16
Semester IV		
1.	Graduate Seminar II	0-0-3-2
2.	M.Tech. Dissertation	16

Electives
Robot Dynamics and Analysis
Optimization Techniques in Engineering
Microcontroller, PLC and Applications
Embedded Sensors and System Design
Power Electronics and Drives
Applications of Signal and Image Processing
Simulation Of Modern Power Systems
Optimal Control.
Digital Control.
Robust Control Systems.
Power Electronics Applications In Power Systems.
Control Techniques In Power Electronics.
Modelling And Simulation Of Power Electronic Systems.
Intelligent Systems And Control
Special Topics In Power Management Circuits
Advanced Signal Processing