

**CURRICULUM
&
ACADEMIC REGULATIONS
POST-GRADUATE PROGRAMME**

**M.Tech. in Power Systems
(2021-2023)**

**Department of Electrical and Electronics Engineering
The National Institute of Engineering
Mysuru-570 008**

Department of Electrical & Electronics Engineering

VISION

The department will be an internationally recognized centre of excellence imparting quality education in Electrical Engineering for the benefit of academia, industry and society at large

MISSION

- M1:** Impart quality education in Electrical and Electronics Engineering through theory and its applications by dedicated and competent faculty
- M2:** Nurture creative thinking and competence leading to innovation and technological growth in the overall ambit of Electrical Engineering
- M3:** Strengthen industry-institute interaction to inculcate best engineering practices for sustainable development of the society

PROGRAM EDUCATIONAL OBJECTIVES

- PEO1:** Graduates will be competitive and have a successful career in Electric Power industry and other organizations.
- PEO2:** Graduates will excel as academicians and contribute to research and development.
- PEO3:** Graduates will demonstrate leadership qualities with professional standards for sustainable development of society.

PROGRAM OUTCOMES

Students graduating from M.Tech. - Power Systems of department of Electrical & Electronics Engineering shall have the ability to:

- PO1:** Independently carry out research/ investigation and development work to solve practical problems in the field of Power Systems engineering.
- PO2:** Write and present a substantial technical report/document.
- PO3:** Demonstrate a degree of mastery in the field of power systems engineering in a technologically changing scenario.
- PO4:** Demonstrate managerial and financial skills.
- PO5:** Demonstrate concern for the safety and environment for sustainable development of society.

LIST OF COURSES OFFERED AS PER CATEGORY

Core – Theory					
AEM1C01	Applied Engineering Mathematics	(4-0-0)4	MPS1E206	Distributed Generation and Micro grid	(3-0-0)3
MPS1C05	Power System Protection	(4-2-0)5	MPS1E207	EHV AC Transmission	(3-0-0)3
MPS1C06	Power System Analysis and Stability	(4-2-0)5	MPS2E306	Electric Vehicles	(3-0-0)3
MPS1C04	Power Electronic Converters and Applications	(3-2-0)4	MPS2E302	Power Quality and Custom Power Devices	(3-0-0)3
			MPS2E305	Cybersecurity in the power sector	(3-0-0)3
MPS1CRM	Research Methodology	(2-0-0)2	MPS2E405	Photovoltaic System Engineering	(3-0-0)3
MPS2C01	Economic Operation of Power Systems*	(4-2-0)5	MPS2E406	IoT in Smart Grid	(3-0-0)3
MPS2C05	Power System Dynamics and Control*	(4-0-0)4	MPS2E403	PLC & SCADA	(3-0-0)3
MPS2C06	Flexible AC Transmission Systems	(4-2-0)5	MPS2E407	Wide Area Monitoring and Control	(3-0-0)3
			MPS2I01	Design and Analysis of Industrial Power System Protection**	(2-0-0)2
MPS2C04	Electrical Power Distribution Automation and Control	(3-2-0)4	MPS3M01	MOOC Elective (Department Specific/Management)	(3-0-0)3
			MPS3M02	MOOC Open Elective (from other departments)	(2-0-0)2
Core –Lab			Project, Seminar, etc		
MPS1L01	Power Systems Lab – I	(0-0-2)1	MPS3C02	Seminar / Paper Presentation	(0-0-0)1
MPS2L01	Power Systems Lab – II	(0-0-2)1	MPS3C03	Internship	(0-0-0)5
Electives			MPS3C04	Project Phase-1	(0-0-0)8
MPS1E101	Restructured Power Systems	(3-0-0)3	MPS4C01	Project Phase-2	(0-0-0)15
MPS1E104	Smart Grid-Technology and Applications	(3-0-0)3			
MPS1E105	Battery Management Systems	(3-0-0)3			
MPS1E205	Control Systems	(3-0-0)3			

* Pre-requisite: Power System Analysis and Stability (MPS1C06)

** Pre-requisite: Power System Protection (MPS1C05)

Semester/ Sl.No.	I	II	III	IV
1	AEM1C01	MPS2C01	MPS3M01	MPS4C01
2	MPS1C05	MPS2C05	MPS3M02	
3	MPS1C06	MPS2C06	MPS3C02	
4	MPS1C04	MPS2C04	MPS3C03	
5	MPS1E1XX	MPS2E3XX	MPS3C04	
6	MPS1E2XX	MPS2E4XX		
7	MPS1CRM	MPS2I01		
8	MPS1L01	MPS2L01		
Total Credits	27	27	19	15

SUGGESTED PLAN OF STUDY

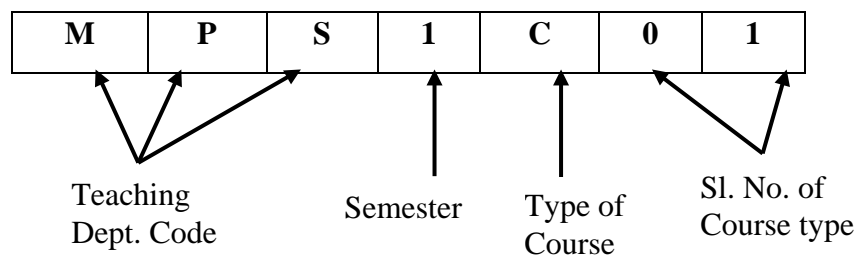
Table of total credits to be earned by a student

Degree Requirements:

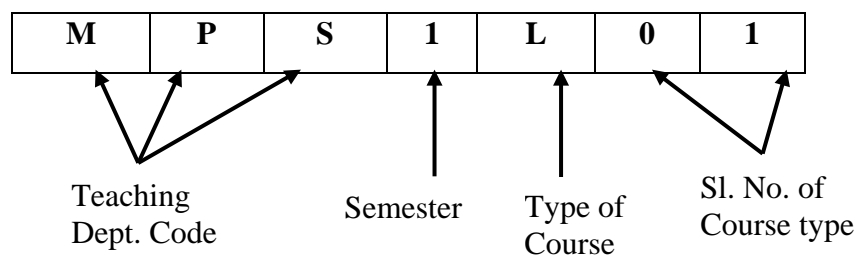
Category of courses	Minimum credits to be earned
	Regular Students
Subject of 1st to 4th Semester	
Basic science	04
Humanities and Social science core	02
Core	34
Dept. Elective	12
Industry Driven Elective	02
MOOC Elective (Department Specific/Management)	03
MOOC Open Elective (from other departments)	02
Seminar/Paper Presentation, Internship, Project, Competency Training	29
Total Credits	88

COURSE NUMBERING SCHEME

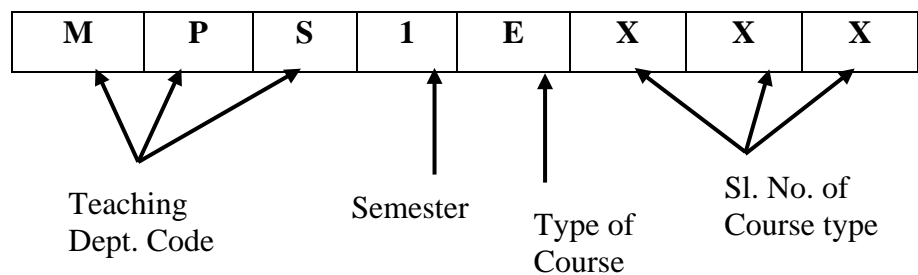
Core



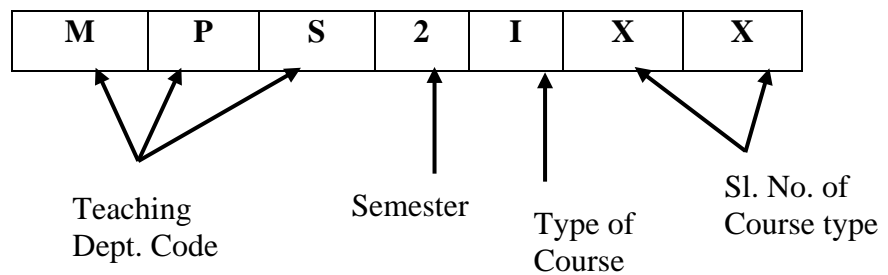
Lab



Elective



Industry Driven Elective



MOOC Elective

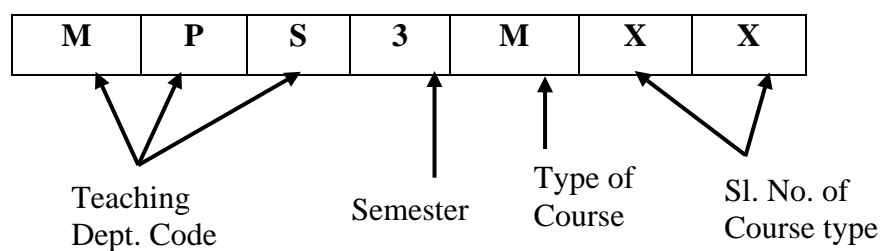


TABLE OF SCHEME AND EXAMINATION FROM 1ST TO 4TH SEMESTER

SCHEME OF TEACHING AND EXAMINATION I SEMESTER							
Sl.No.	Code	Subject	Dept./Board	Hrs/week			Credits
				L	T	P	
1	AEM1C01	Applied Engineering Mathematics	Mathematics	4	0	0	4
2	MPS1C05	Power System Protection	Electrical & Electronics Engg.	4	2	0	5
3	MPS1C06	Power System Analysis and Stability	Electrical & Electronics Engg.	4	2	0	5
4	MPS1C04	Power Electronic Converters and Applications	Electrical & Electronics Engg.	3	2	0	4
5	MPS1E1XX	Elective-1	Electrical & Electronics Engg.	3	0	0	3
6	MPS1E2XX	Elective-2	Electrical & Electronics Engg.	3	0	0	3
7	MPS1CRM	Research Methodology	Electrical & Electronics Engg.	2	0	0	2
8	MPS1L01	Power Systems Lab – I	Electrical & Electronics Engg.	0	0	2	1
Total				31			27

Elective - 1

Sl.No.	Code	Subject	Dept./Board	Hrs/week			Credits
				L	T	P	
1	MPS1E101	Restructured Power Systems	Electrical & Electronics Engg.	3	0	0	3
2	MPS1E104	Smart Grid-Technology and Applications	Electrical & Electronics Engg.	3	0	0	3
3	MPS1E105	Battery Management Systems	Electrical & Electronics Engg.	3	0	0	3

Elective – 2

Sl.No.	Code	Subject	Dept./Board	Hrs/week			Credits
				L	T	P	
1	MPS1E205	Control Systems	Electrical & Electronics Engg.	3	0	0	3
2	MPS1E206	Distributed Generation and Microgrid	Electrical & Electronics Engg.	3	0	0	3
3	MPS1E207	EHV AC Transmission	Electrical & Electronics Engg.	3	0	0	3

**SCHEME OF TEACHING AND EXAMINATION
II SEMESTER**

Sl.No.	Code	Subject	Dept./Board	Hrs/week			Credits
				L	T	P	
1	MPS2C01	Economic Operation of Power Systems*	Electrical & Electronics Engg.	4	2	0	5
2	MPS2C06	Flexible AC Transmission Systems	Electrical & Electronics Engg.	4	2	0	5
3	MPS2C05	Power System Dynamics and Control*	Electrical & Electronics Engg.	4	0	0	4
4	MPS2C04	Electrical Power Distribution Automation and Control	Electrical & Electronics Engg.	3	2	0	4
5	MPS2E3XX	Elective-3	Electrical & Electronics Engg.	3	0	0	3
6	MPS2E4XX	Elective-4	Electrical & Electronics Engg.	3	0	0	3
7	MPS2I01	Design and Analysis of Industrial Power System Protection**	Electrical & Electronics Engg.	2	0	0	2
8	MPS2L01	Power Systems Lab – II	Electrical & Electronics Engg.	0	0	2	1
Total				31			27

Elective – 3

Sl.No.	Code	Subject	Dept./Board	Hrs/week			Credits
				L	T	P	
1	MPS2E306	Electric Vehicles	Electrical & Electronics Engg.	3	0	0	3
2	MPS2E302	Power Quality and Custom Power Devices	Electrical & Electronics Engg.	3	0	0	3
3	MPS2E305	Cybersecurity in the Power Sector	Electrical & Electronics Engg.	3	0	0	3

Elective – 4

Sl.No.	Code	Subject	Dept./Board	Hrs/week			Credits
				L	T	P	
1	MPS2E405	Photovoltaic System Engineering	Electrical & Electronics Engg.	3	0	0	3
2	MPS2E406	IoT in Smart Grid	Electrical & Electronics Engg.	3	0	0	3
3	MPS2E403	PLC & SCADA	Electrical & Electronics Engg.	3	0	0	3
4	MPS2E407	Wide Area Monitoring and Control	Electrical & Electronics Engg.	3	0	0	3

* Pre-requisite: Power System Analysis and Stability (MPS1C06)

** Pre-requisite: Power System Protection (MPS1C05)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING SCHEME OF TEACHING AND EXAMINATION III SEMESTER							
Sl.No.	Subject Code	Subject	Dept./Board	L	T	P	Cr.
1	MPS3M01	MOOC Elective (Department Specific/Management))	Electrical & Electronics Engg.	3	0	0	3
2	MPS3M02	MOOC Open Elective (from other departments)	Electrical & Electronics Engg.	2	0	0	2
3	MPS3C02	Seminar/Paper Presentation	Electrical & Electronics Engg.	0	0	0	1
4	MPS3C03	Internship	Electrical & Electronics Engg.	0	0	0	5
5	MPS3C04	Project Phase-1	Electrical & Electronics Engg.	0	0	0	8
Total Credits							19

Note: MOOC Electives will be decided on the availability courses during the corresponding academic year

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING SCHEME OF TEACHING AND EXAMINATION IV SEMESTER							
Sl.No.	Subject Code	Subject	Dept./Board	L	T	P	Cr.
1	MPS4C01	Project Phase-2	Electrical & Electronics Engg.	0	0	0	15
Total Credits							15