

**SCHEME OF INSTRUCTION AND SYLLABI**

**FULL TIME M.TECH DEGREE IN**

**POWER ELECTRONICS & DRIVES**

**(Department of Electrical Engineering)**



**NATIONAL INSTITUTE OF TECHNOLOGY DELHI**

**(NIT DELHI)**

# **Department of Electrical Engineering**

## **National Institute of Technology Delhi**

### **1.1 About the Department**

Department of Electrical Engineering (EE), National Institute of Technology Delhi was established in 2010 under the aegis of Ministry of Human Resource and Development (MHRD), Govt. of India. Currently it is offering one Undergraduate (B. Tech) course and one Postgraduate (M. Tech) courses in Power Electronics & Drives. The Department also offers PhD programme in relevant areas. The department is equipped with state-of-the-art facilities to carry out research work at all levels. The research focus of the department is in the area of power system reliability, power electronics, renewable energy systems, power systems, control/time delay systems, pattern recognition, image processing etc. The department also actively involved in multi-disciplinary research activities. The UG program is embraced by rigor and span to prepare a practicing engineer for a lifetime of creative work and ongoing technical learning. The department provides healthy & competitive environment for all round development of students leading to several remarkable achievements in GATE, CAT, GRE, TOEFEL, PSUs etc. The department has laboratories, equipped with latest equipment and software platforms, to impart state-of-the-art technical knowledge. The department aims to setup new laboratories such as Green Energy Technologies, Digital Control & FPGA Design, Biometric etc. The Department has active collaborations with Institutes & research institutes in India and abroad.

The Department of EE has a blend of young as well as experienced dynamic faculty members and is committed to provide quality education and research in the field. Faculty members of the department have excellent academic & research credentials and published numerous peer reviewed journal articles/ papers, Books, Book Chapters etc. in diversified field and having adequate experience in advanced research. The department hopes to achieve the national goals and objectives of industrialization and self-reliance. As a result, it hopes to produce graduates with strong academic and practical background so that they can fit into the industry immediately upon graduation.

### **1.2 Vision**

- To excel in education, research and development services in electrical engineering in tune with societal aspirations.

### **1.3 Mission**

- Impart quality education to produce globally competent electrical engineers capable of extending technological services.
- To create entrepreneurial environment and industry interaction for mutual benefit.
- To be a global partner in training human resources in the field of power and energy systems.
- Nurture scientific temperament, professional ethics and industrial collaboration.

**B. Tech. (Electrical Engineering) Semester wise Credit Structure**

Sl. No.	Courses	Credits				Total
		1 <sup>st</sup> Year		2 <sup>nd</sup> Year		
		1 <sup>st</sup> Sem	2 <sup>nd</sup> Sem	3 <sup>rd</sup> Sem	4 <sup>th</sup> Sem	
1	Program Core	09	09	0	0	18
2	Program Electives	09	09	0	0	18
3	Dissertation	0	0	15	20	35
4	Lab	02	02	0	0	04
5	Comprehensive Viva-voce	0	0	05	0	05
Total		20	20	20	20	80

<b>M.Tech. (PED) 1 Year I Semester</b>					
<b>S.No</b>		<b>Course</b>	<b>Course Title</b>	<b>L-T-P</b>	<b>C</b>
1		EEL 501	Power Electronics Devices & Converters (Mandatory)	3-0-0	3
2		EEL 5XX	Core-I	3-0-0	3
3		EEL 5XX	Core-II	3-0-0	3
4		EEL 5XX	Elective-I	3-0-0	3
5		EEL 5XX	Elective - II	3-0-0	3
6		EEL 5XX	Elective - III	3-0-0	3
7		EEL 504	Power Electronics Lab	0-0-3	2
<b>Total</b>				<b>18-0-3</b>	<b>20</b>
<b>M.Tech. (PED) 1 Year II Semester</b>					
<b>S.No</b>		<b>Course</b>	<b>Course Title</b>	<b>L-T-P</b>	<b>C</b>
1		EEL 551	Switched Mode Power Converters (Mandatory)	3-0-0	3
2		EEL 5XX	Core-III	3-0-0	3
3		EEL 5XX	Core-IV	3-0-0	3
4		EEL 5XX	Elective - IV	3-0-0	3
5		EEL 5XX	Elective - V	3-0-0	3
6		EEL 5XX	Elective - VI	3-0-0	3
7		EEL 554	Electrical Drives Lab	0-0-3	2
<b>Total</b>				<b>18-0-3</b>	<b>20</b>
<b>M.Tech. (PED) II Year III Semester</b>					
<b>S.No</b>		<b>Course</b>	<b>Course Title</b>	<b>L-T-P</b>	<b>C</b>
1		EEL 601	Dissertation-I		15
2		EEL 602	Comprehensive Viva-voce		05
<b>Total</b>					<b>20</b>
<b>M.Tech. (PED) II Year IV Semester</b>					
<b>S.No</b>		<b>Course</b>	<b>Course Title</b>	<b>L-T-P</b>	<b>C</b>
1		EEL 651	Dissertation-II		20
<b>Total</b>					<b>20</b>
<b>Total Credits</b>					<b>80</b>

**Departmental Core**

<b>S.No</b>	<b>Course</b>	<b>Course Title</b>	<b>L-T-P</b>
1	EEL 502	Dynamics of Electrical Machines	3-0-0
2	EEL 503	Electrical Drives	3-0-0
3	EEL 552	Advanced Electrical Drives	3-0-0
4	EEL 553	Power Electronics for Renewable Energy Systems	3-0-0

**Departmental Elective**

<b>S.No</b>	<b>Course</b>	<b>Course Title</b>	<b>L-T-P</b>
1	EEL 511	Power Quality	3-0-0
2	EEL 512	Flexible AC Transmission Systems (FACTS)	3-0-0
3	EEL 513	Digital Control in Power Electronic Systems	3-0-0
4	EEL 514	Digital Signal Processor & its applications to Power Electronics	3-0-0
5	EEL 515	Soft Computing and Applications	3-0-0
6	EEL 516	Analog Integrated Circuit Design	3-0-0
7	EEL 517	AI Techniques and Applications	3-0-0
8	EEL 518	Internet of Things	3-0-0
9	EEL 557	Energy Auditing and Management	3-0-0
10	EEL 561	Robust Control	3-0-0
11	EEL 562	Special Electrical Machines	3-0-0
12	EEL 563	Applied Linear Algebra	3-0-0
13	EEL 564	Advanced Control Systems	3-0-0
14	EEL 565	FPGA based Digital Design Techniques	3-0-0
15	EEL 566	Optimal Control	3-0-0
16	EEL 567	Electric Vehicles	3-0-0
17	EEL 568	Energy Storage Devices	3-0-0
18	EEL 569	Telemetry Systems	3-0-0
19	EEL 591	Introduction to Smart Grid	3-0-0
20	EEL 592	DC Microgrid and Control System	3-0-0