CRITERION 6	Facilities and Technical Support	80

The department cherishes a very impressive teaching-learning/research facilities and infrastructure. Apart from teaching learning aids the lab equipment, machines and instruments are at par with the best in the region. Entire details of these facilities are given below.

6.1 ADEQUATE AND WELL-EQUIPPED LABORATORIES AND TECHNICAL MANPOWER (40)

6.1.A: Adequate and well-equipped laboratories to run all the program specific curriculum (25)

Table: 6.1.A(i): Details of facilities and staff in the labs

Sr No	Name of the Laboratory	No. of students per setup (Batch size)	Name of the Important equipment	Weekly utilization status (all the courses for which the lab is utilized)	Technical manpower support		
					Name of the technical staff	Desig-nation	Qualifi-cation
1	Basic Electrical Engineering	8	1) Ammeter: (0.2mA,0.5A,0.1mA,2.5A ,10/20A) 2) Wattmeter: a) 10A/ 250-500 V 1 No. b) 5A/ 75-150V 1 No. c) 2.5-5A/75-300V 1 No. d) 5-10A/ 150-300-600V 3) Capacitive Load Bank: a) 10A b) 30A, 230V 4) Function Generator with digital readout. 5) Condenser Boxes Polystyrene Single dial. 6) DC Regulated Power Supply.	1) B.Tech 3/ELE (Autumn) 2) B.Tech 3/ECE (Autumn) 3) B.Tech 4/MECH (Spring)	Mr. Md. Ismail Wani	Techni-cian	ITI Diploma

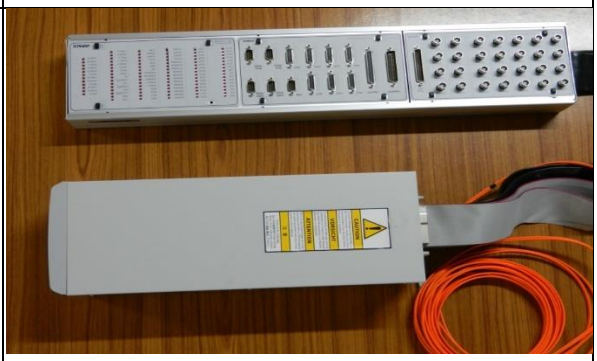
			7) Multimeter, Multi-tester. 8) LCRQ meter. 9) Rheostat.				
2	Control Systems Lab	8	1) Linear System Simulator. 2) Temperature Controller System. 3) Compensation Design. 4) Stepper Motor. 5) Relay Control system. 6) DC Position Control. 7) DC Speed Control. 8) P.I.D Controller. 9) Linear Variable Differential Transformer. 10) Digital Control System. 11) Digital Ohm Meter. 12) Super Capacitor Bank Nominal Cap 98 ~94 uF. 13) Type 0 Control System model, Type 1 Control System Model,Test Signal Generator,Lead- Lag Networks trainer, Potentiometer AS Error Detector, PI control System Trainer.	1) B.Tech 4/ECE (Spring) 2)B.Tech 5/ELE (Autumn)			
3	Electric Measurement Lab	8	1.Power Supply (0-30 V, 0-5 A) 2.Power Supply (0-15 V, 0-6A) 3.Power Supply (0-30V, 0-6A) 4.Oscilloscope Phillips MP 3206 5.Wattmeter (0-8000W) 6.Wattmeter (0-200W)	1) B.Tech 3/CSE Measurement Lab (Autumn) 2)B.Tech 3/IT Measurement Lab (Autumn) 3) B.Tech 4/CHEM Measurement Lab (Spring) 4) B.Tech 4/	Mr. MD Hanief Mir	Lab. Attendant	Matric

			7.Wattmeter (0-4500W) 8.Anderson's Bridge 9.Maxwell's LC Bridge 10.Haye's Bridge 11.Digital Multi-meter Phillips PP-9086	ELE Measurement Lab (Spring)			
4.	Power Systems Lab	8	1. Current Transformer (5A to 10A) 2. Thermometer (0 to 110C) 3. Digital Thermometer (0 to 1200C) 4. Digital Tachometer (Model AT100) 5. Autotransformer a) 4A Single Phase b) 15A Single Phase. 6. 3 Phase Transformer (Type 0-30-30, 30A) 7. Transformer 1:1(2KVA) (Single Phase) 8. Earth fault relay 9. Directional Overcurrent Relay 10. Under frequency Relay 11. Definite time overcurrent Relay 12. Field failure Relay 13. Field failure Relay 14. Instantaneous Differential Relay.	1) B.Tech 5/EEPower System-1 (Autumn) 2)B.Tech 6/EEPower System-2 (Spring) 3)B.Tech 7/ECE Power System (Autumn) 4)B.Tech 7/ ELE Power System Protection (Autumn)	Mr. S.A. Mistry	Senior Technician	Diploma
5.	Power Electronics Lab	7	1. FPGA Boards and Relevant Operating Software 2. 435-II Power Quality and Energy Analyser FLUKE. 3. DSPACE 1104 4. Three Level Inverter Stack (NPC Type) 5. IGBT Based 4 Phase Bridge Converter Trainer with Driver 6. Three Phase IGBT Stack (Rectifier +	1)B.Tech 6/ELE Power Electronics (Spring) 2)B.Tech 3/METT Power Electronics (Autumn) 3).B.Tech 3/CIVIL			

			IGBT Based Inverter) 7. Three Phase IGBT Stack with Chopper(Rectifier + IGBT Based Inverter+ Chopper) 8. SCR Triggering RC Trainer 9. DC to DC Converter Trainer 10. 3 Phase Half Wave Rectifier Trainer 11. SCR Characteristics Curve Apparatus 12. TRIAC and DIAC Characteristics Curve Apparatus.	Power Electronics (Autumn)			
6.	Electrical Machines Lab	8	1. M.G Set AC Motor(30Hp) Dc Generator(20KW) 2. Alternator Set (3 phase) D.C Motor coupled with 3 phase Alternator 3. Synchronous Motor Set a) Motor: 7.5Hp b) Synchronous Motor: 10Hp 4. MG Set D.C. Compound- a) Motor: 5KW b) Generator: 5KW 5. MG Set Shunt a) Motor: 5Hp b) Generator: 3KW 6. S.R. Induction Motor 3phase 5Hp 7. S.R. Induction Motor 3phase 5Hp 8. Scharge Motor	1.B.Tech 4/EE Electrical Machines-1 (Spring) 2.B.Tech 5/EE Electrical Machines-2 (Autumn)	Mr. S.A. Mistry	Senior Technician	Diploma
7.	Microprocessor and DSP Lab	3	1. 8085 Microprocessor trainers 2. Power Supply (0-30V, 0-10A) 3. Universal Programmer 4. EPROM Eraser	B.Tech 6/EE Microprocessor (Spring)	Mr. MD Hanief Mir	Lab. Attendant	Matric

			5. DSP Kits 6. PC's				
8.	Computation Lab	4	1. Dell OptiPlex 9020 Pcs (20) 2. Acer Pcs (10)	1) B. Tech. 5/EE Control Aided Simulation (Autumn) 2)M. Tech. EP&ES Power System Simulation-1 (Autumn) 3) M. Tech. EP&ES Power System Simulation -2 (Spring)			
9.	High Voltage Engineering Lab	7	1. High voltage Impulse Generator 2. High Voltage AC Testing Transformer 3. High Voltage DC Supply 4. High Voltage Insulation Tester				
10	Virtual Instrumentation Lab		1. HPOX 6120 MET Unit Processor Intel – 630,3GHz, 2 MBL 17CAT Monitor 2. 4 Channel textronics Digital Oscilloscope. 3. Acer Computers. 4. Dell computers.				

6.1.A(1) Major equipments installed in various laborators mentioned above:

Sr no	Name of the equipment	Specifications	Quantity	Photograph
1	MicroLabBox from dSPACE	RT1 1202	2	 **Fig. 1:**dSPACE Microlab Box-1202
2	dSPACE controller	RT1 1104	2	 **Fig. 2:**dSPACE Controller Box-1104
3	dSPACE controller	RT1 1103	1	 **Fig. 3:**dSPACE Controller Box-1103
4	Real Time Simulator	Opal RT-4510	2	 **Fig. 4:** Real time simulator by OPAL-RT 4510

5	Programm-able AC supply	IT7622, 715 VA	1	 **Fig. 5:** Three phase programmable AC power supply
6	Power Quality and Motor Analyzer	Fluke	2	 **Fig. 6:** Three phase AC power quality and motor analyser
7	Three Phase Power Quality and Energy Analyzer	Fluke	1	 Fig. 7: Three phase AC power quality and energy analyser

8	Typhoon HIL Real Time Emulator	Typhoon HIL 402	1	 **Fig. 8:** Typhoon HIL real time simulator
9	AC and DC Machines	-	More than 20	 **Fig. 9:** AC and DC machine set
10	Super Capacitor	940F, 75 V	1	 **Fig. 10:** Super capacitor
11	National Instrument LabVIEW	BNC 2120	1	 **Fig. 11:** Multi function microprocesser based National instrument

12	Impulse Generator	400 kV	1	 **Fig. 12:** High voltage Impulse generator
13	Computer Workstation Intel Xeon W-2145 Processor	Tyrone Camarero SS400TR-34- W8C642X2KQ P2K24M- 81RK000	2	 **Fig. 13:** High speed configured workstation dedicated for research
14	HVAC Testing Transformer	150 kV	1	 **Fig. 14:** HVAC transformer tester

The Department of Electrical Engineering has comfortable rooms and cabins with furniture allocated to all the teaching faculty members.

Table 6.1.A(ii): Office space

Room description	**Usage**	**Shared/ Exclusive**	**Capacity**	**Rooms equipped with PC, Internet, Bookrack, Meeting space, etc.**
Office	Electrical Engineering Office	Exclusive	10 sq. m	Furniture, PC, Printer, Scanner, Amirah, Photo Copier.
Committee Room	Seminar Hall/Faculty Meeting Room/Project presentations.	Exclusive	22 sq. m	Furniture, Internet, Multimedia Projector, Laptop, Audio System, White Board, Book Rack.
Prof. (Dr.) S. A. Lone	Faculty Office/Cabin	Exclusive	22 sq. m	Furniture, PC/Laptop, Printer, Book Rack, Scanner.
Prof.(Dr.) M. D. Mufti	Faculty Office/Cabin	Exclusive	22 sq. m	Furniture, PC/Laptop, Printer, Book Rack, Scanner.
Prof.(Dr.) Aijaz Ahmad	Faculty Office/Cabin	Exclusive	22 sq. m	Furniture, PC/Laptop, Printer, Book Rack, Scanner
Dr. A.H. Bhat	Faculty Office/Cabin	Exclusive	22 sq. m	Furniture, PC/Laptop, Printer, Book Rack, Scanner
Dr. S. J. Iqbal	Faculty Office/Cabin	Exclusive	22 sq. m	Furniture, PC/Laptop, Printer, Book Rack, Scanner
Dr. M. A. Bazaz	Faculty Office/Cabin	Exclusive	22 sq. m	Furniture, PC/Laptop, Printer, Book Rack, Scanner
Ms. T. N. Mir	Faculty Office/Cabin	Exclusive	8 sq. m	Furniture, PC/Laptop, Printer, Book Rack, Scanner
HOD’s Room	Faculty Office/ Cabin	Exclusive	22 sq. m	Furniture, PC/Laptop, Printer, Book Rack, Scanner

Dr. Ravi Bhushan	Faculty Office/ Cabin	Exclusive	10 sq. m	Furniture, PC/Laptop, Printer, Book Rack.
Dr. Neeraj Gupta	Faculty Office/ Cabin	Exclusive	10 sq. m	Furniture, PC/Laptop, Printer, Book Rack, Scanner
Dr. Kushal M. Jagtap	Faculty Office/ Cabin	Exclusive	10 sq. m	Furniture, PC/Laptop, Printer, Book Rack, Scanner
Dr. O.C. Sekhar	Faculty Office/ Cabin	Exclusive	10 sq. m	Furniture, PC/Laptop, Printer, Book Rack, Scanner
Dr. Asadur Rehman	Faculty Office/ Cabin	Exclusive	10 sq. m	Furniture, PC/Laptop, Printer, Book Rack, Scanner
Dr. ChilakaRanga	Faculty Office/ Cabin	Exclusive	10 sq. m	Furniture, PC/Laptop, Printer, Book Rack, Scanner
Dr. FarhadIlahi Baksh	Faculty Office/ Cabin	Exclusive	10 sq. m	Furniture, PC/Laptop, Printer, Book Rack, Scanner
Lecture Hall 3 (L3)	Lectures, Tutorials, Examinations of B. Tech, M.Tech and Ph.D. Students	Exclusive	40 sq. m	White Board, Dias, Internet
Lecture Hall 4 (L4)	Lectures, Tutorials, Examinations of B. Tech, M.Tech and Ph.D. Students	Exclusive	40 sq. m	White Board, Dias, Internet
Electrical Engineering Attic 1 (EEA 1)	Lectures, Tutorials, Examinations of B.Tech Students.	Exclusive	40 sq. m	White Board, Dias, Internet, Projector
Room for Contractual Faculty – 1	Faculty Office/ Cabin	Exclusive	10 sq. m	Furniture, PC/Laptop, Printer, Book Rack, Scanner
Room for Contractual Faculty - 2	Faculty Office/ Cabin	Exclusive	10 sq. m	Furniture, PC/Laptop, Printer, Book Rack, Scanner
Room for Research Scholars – 1	Research Work	Exclusive	10 sq. m	Furniture, PC/Laptop, Printer, Book Rack, Scanner

Room for Research Scholars – 2	Research Work	Exclusive	15 sq. m	Furniture, PC/Laptop, Printer, Book Rack, Scanner
Room for Research Scholars - 3	Research Work	Exclusive	10 sq. m	Furniture, PC/Laptop, Printer.

Table 6.1.A(iii): Adequate number of rooms for lectures (core/electives), seminars, tutorials, etc., for the programme

Room description	**Usage**	**Shared/ Exclusive**	**Capacity**	**Rooms equipped with PC, Internet, Bookrack, Meeting space, etc.**
Lecture Hall 3 (L3)	Lectures, Tutorials, Examinations of B. Tech, M. Tech and Ph.D. Students.	Exclusive	40 sq. m	White Board, Dias, Internet
Lecture Hall 4 (L4)	Lectures, Tutorials, Examinations of B. Tech, M. Tech and Ph.D. Students.	Shared	40 sq. m	White Board, Dias, Internet
Electrical Engineering Attic 1 (EEA 1)	Lectures, Tutorials, Examinations of B. Tech Students.	Shared	40 sq. m	White Board, Dias, Projector, Internet
Committee Room	Seminar Hall/Faculty Meeting Room/Project presentations.	Exclusive	22 sq. m	Furniture, Internet, Multimedia Projector, Laptop, Audio System, White Board, Book Rack

6.1.B: Availability of Adequate and Qualified Technical supporting staff (15)

Table 6.1.B(i): Office Staff: Office Staff provided by the University

Name of the technical staff	**Designation**	**Date of Appointment**	**Qualification**		**Responsibility**
			At Joining	**Now**	
Ms. Gulshan	Secretary SG-II	05-07-1986	-	do	To look after the administrative affairs of the Dept and other student academic affairs.

Table 6.1.B(ii): List of technical supporting staff

Name of the technical staff	Designation	Date of joining	Qualification		Responsibility
			At Joining	Now	
Mr. S.A. Mistry	Senior Technician	01.08.1989	Matric with diploma	do	Departmental Workshop, Power Systems Lab, Machines Lab.
Mr. M. Hanief Mir	Lab. Attendant	01.04.1997	Matric	do	Measurement Lab, Microprocessor and DSP Lab.
Mr. Mohd Ismail Wani	Technician	01.10.1991	Matric	2 years diploma ITI	Basic Electrical Lab and In charge storekeeper.
Mr. Manzoor Ahmad Dar	Senior Technician	01.04.1997	Matric	do	Computation Lab
Mr. Abdul Majeed Bhat	Works Assistant	01.04.1994	-	-	High Voltage Engineering Lab
Mr. Gh Qadir Bhat	Technical Assistant	26-04-1991	-	-	Control Systems Lab
Mr. Mohd Altaf Bhat	Senior Technician	01.04.1994	-	-	Power Electronics Lab

Sub criteria	Evaluation	Marks
6.1 Adequate and well-equipped laboratories and technical manpower.	All laboratories are well equipped to run all the programs with sufficient manpower.	**40**

6.2LABORATORIES MAINTENANCE AND OVERALL AMBIENCE(10)

Laboratory description in the curriculum	Space, number of students	Number of experiments	Quality of Instruments	Laboratory manuals
Basic Electrical Engineering Lab	100 sq. m (35)	10	Very Good	Available
Electrical Machines Lab	175 sq. m (35)	26	Very Good	Available
High Voltage Engineering lab	2165 sq. m (35)	09	Excellent	Available

Microprocessor and DSP Lab.	21 sq. m (35)	09	Excellent	Available
Control systems Lab	83 sq. m (35)	06	Very Good	Available
Measurement Lab	25 sq. m (35)	07	Good	Available
Power Electronics Lab.	65 sq. m (35)	14	Very Good	Available
Computation Lab	35 sq. m (35)	03	Very Good	Available
Virtual Instrumentation Lab.	22 sq. m (10)	10	Good	Available
Power Systems Lab	144 sq. m (35)	15	Good	Available

6.2.1: Adequate, well-equipped laboratories to meet the curriculum requirements and the POs

- Department has enough labs which are used for all the years on timetable basis to meet the curriculum requirements.
- The practical oriented courses have associated labs every week in two groups (about 35 students in each group).
- Labs are equipped with sufficient hardware and licensed software to run program specific curriculum and off program curriculum.
- Laboratory are also made available to the students after working hours to carry lab/research work and projects.

6.2.2: Availability of laboratories with technical support within and beyond working hours

- Within the working hours all labs are open to the students to carry their lab/project work with a full technical support and beyond the working hours lab keys are issued to the students.
- Technical support is provided from the Department or from Institute Computer Centre for hardware, software, networking, etc.
- Lab slots are provided depending on the curriculum.
- Wherever necessary, extra labs are engaged depending on the progress in the course practical work.

6.2.3: Equipment to run experiments and their maintenance, number of students per experimental setup, size of the laboratories, overall ambience, etc.

- All the labs have sufficient space to accommodate specified number/batch of students with sufficient number of PCs/workstations/hardware.
- Each student is allotted individual PC/workstation for the lab work assigned.
- All the labs have good ambience and the PCs/workstations/hardware are arranged so as to make the students feel comfortable while working.
- All the equipment is maintained in very good working conditions.

Sub criteria	Evaluation	Marks
6.2 Maintenance and overall ambience	All labs have up to date infrastructure, good lighting, ventilation, 1 or 3 Phase 24*7 power supply with UPS backup, LAN/ Wi-Fi connectivity, Maintenance is carried out as and when necessary, White boards are installed, chairs and benches wherever necessary are provided.	**10**

6.3 SAFETY MEASURES IN THE LABORATORY (10)

i) All the equipment of the laboratories are grounded.
ii) Do's and Don'ts boards are installed at appropriate places
iii) All electrical equipment are protected against over-voltages and short-circuits using MCBs
iv) Fire Extinguishers are installed at appropriate places
v) Safety instructions are demonstrated before entering the labs

Sub criteria	Evaluation	Marks
6.3 Safety measures in laboratories	All labs and their surroundings have sufficient safety measures as mentioned in section 6.3.	**10**

6.4 PROJECT LABORATORY/FACILITIES (FACILITIES AND UTILIZATION) (20)

The departmental laboratories are sufficiently equipped to carry out B. Tech, M. Tech and Ph.D. research projects. Depending on the area of specialization, student(s) are assigned laboratories where they undertake their respective projects with the guidance of their supervisors/laboratory in-charges.

Laboratory	Utilization	Laboratory In-charge	Technical Staff
Basic Electrical Engineering Lab	Hardware implementation, testing, measurement of voltages, currents, power ratings	Dr. M. A. Bazaz	Mr. Mohammad Ismail Wani
Electrical Machines	Hardware implementation,	Dr. S. J. Iqbal	Mr. Showkat Ahmad

Lab	Analysis, measurement and experimentation on machines		Mistri
High Voltage Engineering lab	Testing and measurement of HV AC and DC	Dr. S. J. Iqbal	Mr. Abdul Majeed Bhat
Microprocessor and DSP Lab.	Microprocessor and Microcontroller based projects	Dr. M. A. Bazaz	Mr. Mohd Hanief Mir
Control Systems Lab	Control Systems, Actuators, Electro-mechanical systems	Dr. M. D. Mufti	Mr. Gh. Qadir Bhat
Measurement Lab	Measurements of Currents, Voltages and Power	Dr. S. A. Lone	Mr. Mohd Hanief Mir
Power Electronics Lab.	Electric Drives, Converters, Power Electronics	Dr. A. H. Bhat	Mr. Mohd Altaf Bhat
Computation Lab	Simulation Based Projects	Dr. M. A. Bazaz	Mr. Manzoor Ahmad Dar
Virtual Instrumentation Lab.	Simulation Based Projects and Hardware Interfaced Simulations	Dr. S. A. Lone	-
Power Systems Lab	Power Systems, Transmission Lines etc.	Dr. Aijaz Ahmad	Mr. Showkat Ahmad Mistri

6.4.1: List of Program Specific Labs, computer facilities with departments

1. CAD lab under TEQIP-I Civil.
2. CAD lab under TEQIP-I Civil.
3. Computer Service Centre

Sub criteria	Evaluation	Marks
6.4 Project Laboratories	All labs have up to date infrastructure, good lighting, ventilation, 1 or 3 Phase 24*7 power supply with UPS backup, LAN/Wi-Fi Connectivity, Seating arrangements, Provision to work on projects beyond office hours	**10**

TOTAL MARKS CLAIMED	**80**

Summary of Mark claimed:

6. Facility and Technical support (Max mark: 80)			
Sr. no. of criteria 6	Title	Max mark	Mark claimed
6.1	Adequate and well equipped laboratories	40	40
6.2	Laboratories maintenance and overall ambience	10	10
6.3	Safety measures in the laboratories	10	10
6.4	Project laboratories /facilities (Facilities and utilization)	20	20
Total		**80**	**80**