

राष्ट्रीय प्रौद्योगिकी संस्थान मिजोरम
NATIONAL INSTITUTE OF TECHNOLOGY MIZORAM
(An Institution of National Importance under the Ministry of HRD, Govt. of India)
CHALTLANG, AIZAWL, MIZORAM - 796012



Course Structure & Syllabus for B. Tech Programme in
Electrical Engineering (EE)
BATCH: 2023-24 onwards

Department of Electrical Engineering

**Course Structure & Syllabus for B. Tech Programme in
Electrical Engineering (EE)**

SEMESTER	1 ST SEM	2 ND SEM	3 RD SEM	4 TH SEM	5 TH SEM	6 TH SEM	7 TH SEM	8 TH SEM
CREDIT	20.5	21.5	20	19.5	20.5	17	18	20
TOTAL CREDIT=157								

1 Hr. Lecture (L) per week	1 credit	1 Hr. Laboratory (P) per week	0.5 credit
1 Hr. Tutorial (T) per week	1 credit	AUDIT Course	NO Credit

SEMESTER: I (Common to all Branches)

Sl No.	Subject Code	Subject Name	Category	Periods			Contact Hours	Credits
Theory				L	T	P		
1.	MAL 1101	Engineering Mathematics – I	DC	3	1	0	4	4
2.	CHL 1101	Engineering Chemistry	DC	3	0	0	3	3
3.	HUL 1101	Communicative English	DC	2	0	0	2	2
4.	MEL 1101	Engineering Mechanics	DC	3	0	0	3	3
5.	EEL 1101	Basic Electrical Engineering	DC	3	0	0	3	3
6.	OBE 1101	Outcome Based Education	DC	1	0	0	1	0 (Audit)
Laboratory								
7.	CHP 1101	Engineering Chemistry Laboratory	DC	0	0	3	3	1.5
8.	HUP 1101	Language Laboratory	DC	0	0	2	2	1
9.	MEP 1101	Engineering Mechanics Laboratory	DC	0	0	3	3	1.5
10.	EEP 1101	Basic Electrical Engineering Laboratory	DC	0	0	3	3	1.5
		TOTAL:		15	1	11	27	20.5

SEMESTER : II (Common to all Branches)

Sl No.	Subject Code	Subject Name	Category	Periods			Contact Hours	Credits
Theory				L	T	P		
1.	MAL 1202	Engineering Mathematics – II	DC	3	1	0	4	4
2.	PHL 1201	Engineering Physics	DC	3	0	0	3	3
3.	HUL 1202	Social Science	DC	2	0	0	2	2
4.	CSL 1201	Introduction to Computer Programming	DC	3	0	0	3	3
5.	ECL 1201	Basic Electronics Engineering	DC	3	0	0	3	3
Laboratory								
6.	PHP 1201	Engineering Physics Laboratory	DC	0	0	3	3	1.5
7.	CSP 1201	Introduction to Computer Programming Laboratory	DC	0	0	3	3	1.5
8.	MEP 1202	Engineering Drawing	DC	0	0	4	4	2
9.	MEP 1203	Workshop	DC	0	0	3	3	1.5
10.	ECA 1201	Extracurricular Activity	DC	-	-	-	-	-
		TOTAL:		14	1	13	28	21.5

SEMESTER: III

Sl No.	Subject Code	Subject Name	Category	Periods			Contact Hours	Credits
Theory				L	T	P		
1.	EEL 1301	Circuit Theory	DC	3	1	0	4	4
2.	EEL 1302	Electromagnetic Field Theory	DC	3	0	0	3	3
3.	EEL 1303	Electrical and Electronics Measurements	DC	3	1	0	4	4
4.	MAL 1304	Numerical Methods and Probability Theory	DC	3	0	0	3	3
5.	ECL 1302	Digital Logic Design	DC	3	0	0	3	3
Laboratory								
6.	EEP 1301	Circuit Theory Laboratory	DC	0	0	2	2	1
7.	EEP 1303	Electrical and Electronics Measurement Laboratory	DC	0	0	2	2	1
8.	ECP 1302	Digital Logic Design Laboratory	DC	0	0	2	2	1
		TOTAL :		15	2	6	23	20

SEMESTER: IV

Sl No.	Subject Code	Subject Name	Category	Periods			Contact Hours	Credits
Theory				L	T	P		
1.	EEL1401	Electrical Machines-I	DC	3	0	0	3	3
2.	EEL1402	Power Systems – I	DC	3	0	0	3	3
3.	EEL1403	Power Plant Engineering	DC	3	0	0	3	3
4.	EEL1404	Control Systems-I	DC	3	0	0	3	3
5.	ECL1401	Analog Circuits	DC	3	1	0	4	4
Laboratory								
6.	EEP 1401	Electrical Machines-I Laboratory	DC	0	0	2	2	1
7.	EEP1402	Power Systems – I Laboratory	DC	0	0	2	2	1
8.	ECP1401	Analog Circuits Laboratory	DC	0	0	3	3	1.5
		TOTAL:		15	1	7	23	19.5

SEMESTER: V

Sl No	Subject Code	Subject Name	Category	Periods			Contact Hours	Credits
Theory				L	T	P		
1.	EEL1501	Electrical Machines-II	DC	3	0	0	3	3
2.	EEL1502	Power Systems-II	DC	3	0	0	3	3
3.	EEL1503	Power Electronics	DC	3	0	0	3	3
4.	ECL1501	Digital Signal Processing	DC	3	0	0	3	3
5.	ECL1502	Microprocessors & Microcontrollers	DC	3	0	0	3	3
6.	HUL1501	Managerial Economics	DC	2	0	0	2	2
Laboratory								
7.	EEP1501	Electrical Machines-II Laboratory	DC	0	0	2	2	1
8.	EEP 1503	Power Electronics Laboratory	DC	0	0	2	2	1
9.	ECP1502	Microprocessor & Microcontroller Laboratory	DC	0	0	3	3	1.5
		TOTAL:		17	0	7	24	20.5

SEMESTER: VI

Sl No.	Subject Code	Subject Name	Category	Periods			Contact Hours	Credits
Theory				L	T	P		
1.	EEL1601	Switchgear and Protection	DC	3	0	0	3	3
2.	EEL1602	Electrical Drives	DC	3	0	0	3	3
3.	EEL1603	Control Systems-II	DC	3	0	0	3	3
4.	EEL16XX	Departmental Elective -I	DE	3	0	0	3	3
5.	CHL1601	Environmental Science	DC	2	0	0	2	2 (Pass/ Fail)
Laboratory								
6.	EEP1601	Power Systems – II Laboratory	DC	0	0	2	2	1
7.	EEP1602	Electrical Drives Laboratory	DC	0	0	2	2	1
8.	EEP1603	Control Systems Laboratory	DC	0	0	2	2	1
9.	EEP1604	Electrical Machine Design	DC	1	0	2	3	2
		TOTAL:		15	0	8	23	17

SEMESTER: VII

Sl No.	Subject Code	Subject Name	Category	Periods			Contact Hours	Credits
Theory				L	T	P		
1.	EEL17XX	Departmental Elective -II	DE	3	0	0	3	3
2.	EEL 17XX	Departmental Elective -III	DE	3	0	0	3	3
3.	EEL 17XX	Departmental Elective -IV	DE	3	0	0	3	3
4.	EEL 17XX	Open Elective – I	OE	3	0	0	3	3
Laboratory								
5.	EED1701	Project Phase-1	DC	0	0	8	8	4
6.	EEG1702	Seminar	DC	0	0	2	2	1
7.	EEV1702	Industrial Training Viva	DC	0	0	2	2	1
		TOTAL:		12	0	12	24	18

SEMESTER: VIII

Sl No.	Subject Code	Subject Name	Category	Periods			Contact Hours	Credits
Theory				L	T	P		
1.	EEL 18XX	Departmental Elective-V	DE	3	0	0	3	3
2.	EEL 18XX	Departmental Elective-VI	DE	3	0	0	3	3
3.	EEL 18XX	Open Elective - II	OE	3	0	0	3	3
Laboratory								
4.	EED1804	Final Project	DC	0	0	20	10	10
5.	EEV1804	Grand Viva	DC	0	0	2	2	1
		TOTAL:		9	0	22	21	20

DEPARTMENTAL ELECTIVE COURSE (ELECTRICAL ENGINEERING)

Sl No.	Subject Code	Subject Name	Hrs/Week L: T:P	Credits
1	EEL 1X11	High Voltage and Insulation Engineering	3:0:0	3
2	EEL 1X12	Extra High Voltage AC and DC Transmission	3:0:0	3
3	EEL 1X13	Utilization of Electrical Power	3:0:0	3
4	EEL 1X14	Advanced Control System	3:0:0	3
5	EEL 1X15	Smart Grid	3:0:0	3
6	EEL 1X16	Power Systems Operation and Control	3:0:0	3
7	EEL 1X17	Advanced Electric Drives	3:0:0	3
8	EEL 1X18	Instrumentation Engineering	3:0:0	3
9	EEL 1X19	Smart Appliances and Internet of Things	3:0:0	3
10	EEL 1X20	SCADA system and Applications	3:0:0	3
11	EEL 1X21	HVDC Transmission	3:0:0	3
12	EEL 1X22	Special Electrical Machines	3:0:0	3
13	EEL 1X23	Modeling and Control of Power Electronic Converters	3:0:0	3
14	EEL 1X24	Advanced Power System Protection	3:0:0	3
15	EEL 1X25	Flexible AC Transmission Systems	3:0:0	3
16	EEL 1X26	Energy Storage Systems	3:0:0	3
17	EEL 1X27	Data Science Applications in Power Engineering	3:0:0	3
18	EEL 1X28	Machine Learning and Deep Learning	3:0:0	3
19	EEL 1X29	Deregulated Smart Grids	3:0:0	3
20	EEL 1X30	Signal Processing in Smart Grids	3:0:0	3
21	EEL 1X31	Micro grid Dynamics and Control	3:0:0	3
22	EEL 1X32	Grid Integration of Electric Vehicles	3:0:0	3
23	EEL 1X33	Adaptive and Robust Control Systems	3:0:0	3
24	EEL 1X34	Evolutionary Algorithms Application in Power Engineering	3:0:0	3
25	EEL 1X35	Smart Grid Resiliency and Cyber Security	3:0:0	3
26	EEL 1X36	Cloud Computing and Big Data Analytics in Smart Grids	3:0:0	3
27	EEL 1X37	Challenges and Solutions in Renewable Integration	3:0:0	3
28	EEL 1X38	Smart Electrical Distribution System	3:0:0	3
29	EEL 1X39	Power Quality	3:0:0	3

Note: Depending on the specializations of the faculty members, subjects will be added to the list.

OPEN ELECTIVE COURSE (ELECTRICAL ENGINEERING)

SINo.	Subject Code	Subject Name	Hrs/Week L: T:P	Credits
1	EEL 1X51	Renewable energy	3:0:0	3
2	EEL 1X52	Electrical Engineering Materials	3:0:0	3
3	EEL 1X53	Control Systems Design	3:0:0	3
4	EEL 1X54	Soft Computing Techniques and Applications	3:0:0	3
5	EEL1X55	Optimization Techniques	3:0:0	3

Note: Depending on the specializations of the faculty members, subjects will be added to the list.

Structure of Undergraduate Engineering program:

Sl No.	Topic	Credits of EE Curriculum
1.	Humanities and Social Sciences including Management	07
2.	Basic Sciences	22
3.	Engineering Sciences including workshops, drawing, basics of electrical/mechanical/computer, etc.	18
4.	Professional Core Subjects	46
5.	Professional Core Subjects (from other Branches/departments)	24
6.	Professional Subjects: Subjects relevant to chosen specialization/branch	18
7.	Open Subjects: Electives from other technical and/or emerging subjects	06
8.	Project work, seminar, and internship in industry or elsewhere	17
9.	Mandatory Courses [Environmental Sciences, Induction Program, Indian Constitution, Essence of Indian Traditional Knowledge]	02

Credit distribution in the First year of Undergraduate Engineering program:

Subject Name	Lecture	Tutorial	Laboratory	Total Credits
Chemistry	3	0	1.5	4.5
Physics	3	0	1.5	4.5
Mathematics-I	3	1	0	4
Mathematics-II	3	1	0	4
Programming for Problemsolving	3	0	1.5	4.5
English	2	0	2	3
Engineering Graphics/ Drawing	0	0	4	2
Workshop /Laboratory	0	0	1.5	1.5
Basic Electrical Engineering	3	0	1.5	4.5
Engineering Mechanics	3	0	1.5	4.5
OBE (Outcome Based Education)	1	0	0	1
Social Science (Humanities)	2	0	0	2
Basic Electronics Engineering	3	0	0	3