PROPOSED COURSE STRUCTURE AS PER NEP-2020

Program	**B. Tech. in Electrical & Computer Engineering with Honours Degree OR Minor Specialization**
Duration	**4 years**

Effective from July 2024

S. No.	Courses	Credits								Total	No. of Courses
		1st Year		2nd Year		3rd Year		4th Year			
		1st Sem.	2nd Sem.	3rd Sem.	4th Sem.	5th Sem.	6th Sem.	7th Sem.	8th Sem.		
1	Basic Science Course (**BSC**)	9	9	3						21	7
2	Basic Science- Laboratory Course (**BSC-L**)	4	1							5	4
3	Engineering Science Course (**ESC**)	6	9							15	5
4	Engineering Science-Laboratory Course (**ESC-L**)	1	3		2					6	4
5	Humanities, Social Sciences including Management Courses (**HSMC**)	2			6					8	3
6	Humanities, Social Sciences including Management Courses (**HSMC-L**)	1								1	1
7	Professional core courses (**PCC**)			12	9	15	12			48	16
8	Professional core courses- Laboratory Course (**PCC-L**)			4	3	4	4			15	15
9	Professional Electives courses (**PEC**)					3	3	12		18	6
10	Open Electives courses (**OEC**)							3	6	9	3
11	Seminar/ Internship/ Minor Project/ Major Project (**PROJ**)						1	2+3	6	12	4
12	Mandatory Course (**MC**)		0	3	2					5	3
	Total	23	22	22	22	22	20	20	12	163	71

Abbreviations

L	Lecture
T	Tutorial
P	Practical
C	Credits
CCA	Continuous Class Assessment
MSE	Mid Semester Evaluation
ESE	End Semester Evaluation

B. TECH. ELECTRICAL & COMPUTER ENGINEERING – I YEAR

FIRST SEMESTER

S. No	COURSE CODE	COURSE NAME	COURSE TYPE		Credits	L	T	P	HRS
1.	AST-101	Communication Skills	Theory	HSMC	2	2	0	0	2
2.	ASB-101	Engineering Physics I	Theory	BSC	3	3	0	0	3
3.	ASB-102	Engineering Chemistry	Theory	BSC	3	3	0	0	3
4.	ASB-103	Engineering Mathematics I	Theory	BSC	3	3	0	0	3
5.	EES-101	Basics of Electrical Engineering	Theory	ESC	3	3	0	0	3
6.	CSS-101	Fundamentals of Computing	Theory	ESC	3	3	0	0	3
i.	ASL-101	Language Laboratory	Lab	HSMC-L	1	0	0	2	2
ii.	ASL-102	Engineering Physics Laboratory I	Lab	BSC-L	1	0	0	2	2
iii.	ASL-103	Engineering Chemistry Laboratory	Lab	BSC-L	1	0	0	2	2
iv.	MEL-101	Engineering Graphics & Design	Lab	BSC-L	2	0	0	4	4
v.	ASL-104	Design Thinking & Idea Lab	Lab	ESC-L	1	0	0	2	2
				Total	**23**	**17**	**0**	**12**	**29**

SECOND SEMESTER

S. No	COURSE CODE	COURSE NAME	COURSE TYPE		Credits	L	T	P	HRS
1.	ASB-201	Engineering Physics II	Theory	BSC	3	3	0	0	3
2.	ASB-202	Engineering Mathematics II	Theory	BSC	3	3	0	0	3
3.	ASB-203	Biology for Engineers	Theory	BSC	3	3	0	0	3
4.	ECS-201	Basics of Electronics & Communication Engineering	Theory	ESC	3	3	0	0	3
5.	MES-201	Basics of Mechanical Engineering	Theory	ESC	3	3	0	0	3
6.	CES-201	Basics of Civil Engineering	Theory	ESC	3	3	0	0	3
7.	ASM-201	Constitution of India	Theory	MC-I	0	2	0	0	2
i.	ASL-201	Engineering Physics Laboratory II	Lab	BSC-L	1	0	0	2	2
ii.	MEL-201	Workshop Practice	Lab	ESC-L	2	0	0	4	4
iii.	MEL-202	Engineering Mechanics Laboratory	Lab	ESC-L	1	0	0	2	2
				Total	**22**	**20**	**0**	**8**	**28**

B. TECH. ELECTRICAL & COMPUTER ENGINEERING – II YEAR

THIRD SEMESTER

S. No	COURSE CODE	COURSE NAME	COURSE TYPE		Credits	L	T	P	HRS
1.	ASM-301	Mandatory Course : Universal Human Values	Theory	MC-II	3	3	-	-	3
2.	ASM-302	Mandatory Course: Essence of Indian Traditional Knowledge	Theory	MC-IV	0	2	-	-	2
3.	ASB-301	Engineering Mathematics- III (Probability and Statistics)	Theory	BSC	3	3	-	-	3
4.	EEC-302	Network Analysis	Theory	PCC	3	3	-	-	3
5.	EEC-303	Signals and System	Theory	PCC	3	3	-	-	3
6.	EEC-305	Data Structures and Algorithm**s**	Theory	PCC	3	3	-	-	3
7.	EEC-306	Electric Machines & Power System	Theory	PCC	3	3	-	-	3
i.	EEL-302	Network Analysis Lab.	Lab	PCC-L	1	-	-	2	2
ii.	EEL-303	Signals and System Lab	Lab	PCC-L	1	-	-	2	2
iii.	EEL-305	Data Structures and Algorithms Lab	Lab	PCC-L	1	-	-	2	2
iv.	EEL-306	Electric Machines & Power System Lab	Lab	PCC-L	1	-	-	2	2
				Total	**22**	**20**	**-**	**8**	**28**

FOURTH SEMESTER

S. No	COURSE CODE	COURSE NAME	COURSE TYPE		Credits	L	T	P	HRS
1.	ASM-401	Mandatory Course: Environmental Science	Theory	MC-III	2	2	-	-	2
2.	AST-401	OE-I (Operations Research)	Theory	HSMC	3	3	-	-	3
3.	AST-402	OE-II (Engg. Economics)	Theory	HSMC	3	3	-	-	3
4.	EEC-403	Power Electronics	Theory	PCC	3	3	-	-	3
5.	EEC-404	Analog and Digital Electronics	Theory	PCC	3	3	-	-	3
6.	EEC-405	Object Oriented Programming	Theory	PCC	3	3	-	-	3
i.	EEL-403	Power Electronics Lab	Lab	PCC-L	1	-	-	2	2
ii.	EEL-404	Analog and Digital Electronics Lab.	Lab	PCC-L	1	-	-	2	2
iii.	EEL-405	Object Oriented Programming Lab	Lab	PCC-L	1	-	-	2	2
iv.	ASL-401	Numeric & Scientific Computing Lab	Lab	ECS-L	2	-	-	4	4
				Total	**22**	**19**	**0**	**10**	**29**

B. TECH. ELECTRICAL & COMPUTER ENGINEERING –III YEAR

FIFTH SEMESTER

S. No	COURSE CODE	COURSE NAME	COURSE TYPE		Credits	L	T	P	HRS
1.	EEC-501	Control Systems	Theory	PCC	3	3	-	-	3
2.	EEC-506	Measurement and Instrumentation	Theory	PCC	3	3	-	-	3
3.	EEC-507	Data Communications & Computer Networks	Theory	PCC	3	3	-	-	3
4.	EEC-508	Computer Architecture	Theory	PCC	3	3	-	-	3
5.	EEC-509	Artificial Intelligence & Machine Learning	Theory	PCC	3	3	-	-	3
6.		**Professional Elective Courses-I** EEC-502 Switchgear & Protection/ EEE-510 Digital Signal Processing/ EEE-511 Introduction to Robotics/ EEE-512 Database Management Systems	Theory	PEC	3	3	-	-	3
i.	EEL-501	Control Systems Lab.	Lab	PCC-L	1	-	-	2	2
ii.	EEL-506	Measurement & Instrumentation Lab	Lab	PCC-L	1	-	-	2	2
iii.	EEL-507	Data Communications and Computer Network Lab.	Lab	PCC-L	1	-	-	2	2
iv.	EEL-509	Artificial Intelligence and Machine Learning Lab.	Lab	PCC-L	1	-	-	2	2
				Total	**22**	**18**	**-**	**8**	**26**

SIXTH SEMESTER

S. No	COURSE CODE	COURSE NAME	COURSE TYPE		Credits	L	T	P	HRS
1.	EEC-603	Power Systems Analysis	Theory	PCC	3	3	-	-	3
2.	EEC-604	SCADA & Smart Grid Technologies	Theory	PCC	3	3	-	-	3
3.	EEC-605	Microprocessors & Microcontrollers	Theory	PCC	3	3	-	-	3
4.	EEC-606	Operating Systems	Theory	PCC	3	3	-	-	3
5.		**Professional Elective Courses-II** EEE-602 HVDC Transmission/ EEE-603 Electrical Power Gen./ EEE-604 Intro to Cyber Security/ EEE-605 Theory of Computation/ EEE-606 Data Mining	Theory	PEC	3	3	-	-	3
i.	EEL-603	Power Sys Analysis(MATLAB-based)	Lab	PCC-L	1	-	-	2	2
ii.	EEL-604	SCADA & Smart Grid Technologies Lab	Lab	PCC-L	1	-	-	2	2
iii.	EEL-605	Microprocessors & Microcontrollers L	Lab	PCC-L	1	-	-	2	2
iv.	EEL-606	Operating Systems Lab.	Lab	PCC-L	1	-	-	2	2
v.	EEP-601	Seminar (Literature Review)	Lab	PROJ-I	1	-	-	2	2
				Total	**20**	**15**	**-**	**8**	**24**

B. TECH. ELECTRICAL & COMPUTER ENGINEERING –IV YEAR

SEVENTH SEMESTER

S. NO	COURSE CODE	COURSE NAME	COURSE TYPE		CREDITS	L	T	P	HRS
1.		**Professional Electives Courses-III** EEE-702 Embedded Systems/ EEE-703 Power System Op. & Control/ EEE-711 Compiler Design	Theory	PEC	3	3	-	-	3
2.		**Professional Electives Courses-IV** EEO-702 Robotics & Automation / EEE-705 Adv. Protective Relays/ EEE-712 Big Data Analytics	Theory	PEC	3	3	-	-	3
3.		**Professional Electives courses-V** EEE 709 VLSI Design / EEE 713 Cloud Computing / EEE 714 Electric Drives	Theory	PEC	3	3	-	-	3
4.		**Professional Electives Courses-VI** EEE 710 Adv. Power Electronics/ EEE 715 Deep Learning/ EEE 716 GPU Computing	Theory	PEC	3	3	-	-	3
5.		**Open Elective-III** EEO 703 Software Engg. / EEO 704 Power System Automation/ EEO 705 Cyber Physical Systems	Theory	OEC	3	3	-	-	3
i.	EEP-701	Summer Internship	Internship	PROJ-II	2	-	-	4	4
ii.	EEP-702	Minor Project	Project	PROJ-III	3	-	-	6	6
		702		**Total**	**20**	**15**	**0**	**10**	**25**

* During last summer vacation (Minimum 6-8 weeks)

B. TECH. ELECTRICAL & COMPUTER ENGINEERING –IV YEAR

EIGHTH SEMESTER

S. NO	COURSE CODE	COURSE NAME	COURSE TYPE		CREDITS	L	T	P	HRS
1.		**Open Elective-IV (SWAYAM NPTEL/ MOOCs)** EEO 803 Grid Protection & Control/ EEO 806 Computing & Sustainability/ EEO 807 Adv Cybersecurity/ EEO 808 NLP	Theory	OEC	3	3	-	-	3
2.		**Open Elective-V (SWAYAM NPTEL/ MOOCs)** EEO 805 Electricity Markets/ EEO 809 Evolutionary Optimization Tech/ EEO 810 Blockchain Tech/ EEO 811 Image Processing & Computer Vision	Theory	OEC	3	3	-	-	3
i.	EEP-801	Major Project	Project	PROJ-IV	6	-	-	12	12
				Total	**12**	**06**	**0**	**12**	**18**

*If semester-long project work is done in the industry/internship, the OECs in VIII sem may be offered in online mode/NPTEL on SWAYAM.

Total Semester-wise Credit Breakdown

Total	Semesters								Total Credits
	I	II	III	IV	V	VI	VII	VIII	
	23	22	24	22	21	19	20	12	**163**

HONOURS DEGREE IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

S. No	COURSE CODE	COURSE NAME	COURSE TYPE		Credits	L	T	P	HRS
		FOURTH SEMESTER							
1.	EEH-414	Mathematics for AI & ML	Theory	PCC	3	3	0	0	3
		FIFTH SEMESTER							
2.	EEH-514	Data Analytics	Theory	PCC	3	3	0	0	3
		SIXTH SEMESTER							
3.	EEH-614	Deep Learning	Theory	PCC	3	3	0	0	3
i	EEL-624	Deep Learning Lab	Lab	PCC-L	1	0	0	2	2
		SEVENTH SEMESTER							
4.	EEH-714	Generative AI and LLMs	Theory	PCC	3	3	0	0	3
ii	EEP-724	Generative AI Project	Project	PROJ-V	2	0	0	4	4
		EIGHTH SEMESTER							
5.	EEH-814	Special Topics in AI and ML **(SWAYAM NPTEL/ MOOCs)** NLP/Computer Vision/Artificial Intelligence for Economics/Machine Learning for Earth System Sciences/Machine Learning in Agriculture/Responsible & Safe AI Systems	Theory	PCC	3	3	0	0	3
				Total	**18**	**15**	**0**	**6**	**21**