



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(Deemed University)
(Declared Under Distinct Category by Ministry of Education, Government of India)
NAAC Accredited with A++ Grade
Department of Electronics Engineering



**Online Board of Studies Meeting
of Electronics and
Telecommunication Engineering held on 11.09.2024**



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(Deemed University)

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Department of Electronics Engineering

The Board of Studies (BoS) meeting of the Electronics Engineering department was held on 11th Sept 2024 at 1:00 PM onwards. Following external and internal members have attended online meeting through google link : <https://meet.google.com/eez-qjnz-ukg> .



1. Dr. Aditya Trivedi, Professor, Department of Information Technology, ABV-IIITM , Gwalior, External Member.
2. Dr. Urmila Patil, Professor, Department of Electronics and Communication, Dr. D.Y.Patil Institute of Technology, Pune, External Member.
3. Dr. P. K Singhal, Professor
4. Dr.Vandana Vikas Thakare, Professor & Head
5. Dr. Laxmi Shrivastava, Professor
6. Dr. Karuna Markam, Associate Professor
7. Dr. R. P. Narwaria, Assistant Professor,
8. Prof Madhav Singh, Assistant Professor
9. Prof Pooja Sahoo, Assistant Professor
10. Prof D. K. Parsedia, Assistant Professor
11. Dr. Vikas Mahor, Assistant Professor
12. Dr. Rahul Dubey, Assistant Professor
13. Dr. Hemant Choubey, Assistant Professor
14. Dr. Deepak Batham, Assistant Professor
15. Dr. Varun Sharma, Assistant Professor
16. Dr. Shubhi Kansal, Assistant Professor
17. Dr. Himanshu Singh, Assistant Professor
18. Dr. Varun Mishra, Assistant Professor
19. Dr. Mukesh Kumar Mishra, Assistant Professor
20. Dr. Dablu Kumar, Assistant Professor
21. Prof. Prateek Bhadauria, Assistant Professor
22. Prof. Rachit Jain, Assistant Professor
23. Dr. R. Jenkin Suji, Assistant Professor
24. Dr. Jaydeep Parmar, Assistant Professor

Student Members

1. Priyal Saxena, EC-2nd Year
2. Divyansh Samadhiya, EC-2nd Year
3. Vandana Gurjar, EC-4th Year
4. Priyansi Singh, EC-4th Year
5. Mahak Jadhvani, EC-3rd Year
6. Nishkarsh Sharma, ET-3rd Year



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BoS Agenda Items	
Item 1	To propose the scheme structure for the Batch admitted in 2024-25 academic session under the Madhav Institute of Technology & Science-Deemed University (MITS-DU) (The total credits from I-VIII semester should not be less than 160 for this batch). The scheme structure of B.Tech. Ist Semester for the Batch admitted in 2024-25 under the Madhav Institute of Technology & Science-Deemed University (MITS-DU) has been discussed and finalized. Annexure I
Item 2	To review & finalize the syllabi for all courses of B. Tech I Semester (for batch admitted in 2024-25) under the flexible curriculum along with their COs. The syllabi for all courses of B. Tech I Semester (for batch admitted in 2024-25) under the flexible curriculum along with their COs has been discussed and finalized. Annexure II
Item 3	To review and finalize the Experiment list/ Lab manual for all the Laboratory Courses and Micro Project-I to be offered in B.Tech. I semester along with their COs. The Experiment list/ Lab manual for all the Laboratory Courses and Micro Project-I to be offered in B.Tech. I semester along with their COs has been discussed and finalized. Annexure III
Item 4	To discuss and recommend the scheme structure for the Batch admitted in 2024-25 academic session & syllabi of I semester PG Programme under the Madhav Institute of Technology & Science-Deemed University (MITS-DU) (M.E./M.Tech./MCA/MBA/MUP) along with their Course Outcomes (COs). NA
Item 5	To review and finalize the syllabus/module of Classified Novel Engaging Course to be offered in I semester of PG programme. NA
Item 6	Any other matter.

The following suggestions were provided by the external BOS members:

1. As per the suggestion given by external members, level of COs in few subject have been reconstructed.
2. M.Tech IIIrd and IVth semester scheme must include a MOOC course along with the dissertation work.
3. It has been suggested that Minor evaluation may be MCQ and Major Evaluation in PP mode.
4. For Specialisation Course the prerequisite must be taken care of in the scheme structure.



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Annexure I

Item 1	To propose the scheme structure for the Batch admitted in 2024-25 academic session under the Madhav Institute of Technology & Science-Deemed University (MITS-DU) (The total credits from I-VIII semester should not be less than 160 for this batch).
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Scheme of Evaluation

B. Tech. I Semester (/ET) (for batch admitted in academic session 2024-25)

S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted						Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Major Evaluation.	Duration of Major Evaluation.
				Theory Block				Practical Block									
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation								
				Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment		Lab Work & Sessional									
1.	20241101	DC	Instrumentation & Sensors	20	20	30	30	-	-	100	3	-	-	3	Face to Face	MCQ	2 Hrs
2.	20241102	ESC	Computer Programming	20	20	30	30	-	-	100	2	-	-	2	Face to Face	MCQ	2 Hrs
3.	20241103	DC	Electronic Devices	20	20	30	30	-	-	100	2	1	-	3	Face to Face	PP	2 Hrs
4.	20241104	DC	Network Theory	20	20	30	30	-	-	100	2	1	-	3	Face to Face	PP	2 Hrs
5.	20241105	ESC	Basic Electrical & Electronics Engineering	20	20	30	30	-	-	100	2	-	-	2	Face to Face	MCQ	2 Hrs
6.	20241106	DLC	Computer Programming Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
7.	20241107	DLC	Electrical & Electronics Engineering Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
8.	20241108	SP	Semester Proficiency ^s	-	-	-	-	50	-	50	-	-	2	1	Face to Face	SO	-
9.	20241109	PBL	Micro Project-I	-	-	-	-	70	30	100	-	-	2	1	Experiential	SO	-
10.	20241110	ESC	Engineering Chemistry Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
11.	NECXXXXX	NEC	Novel Engaging Course (Activity Based Learning)	-	-	-	-	50	-	50	-	1	-	1	Interactive	SO	-
Total				100	100	150	150	380	120	1000	11	03	10	19	-	-	-
12.	20241111	MAC	Universal Human Values & Professional Ethics (UHVPE)	20	20	30	30	-	-	100	2	-	-	GRADE	Blended	MCQ	1.5 Hrs
13.		MWS	Mandatory Workshop on Indian Constitution and Traditional Knowledge at Department Level (Duration: Two Days)											GRADE	Interactive	MCQ	-
Induction programme of three weeks (MC): Physical activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to local Areas, Familiarization to Dept./Branch & Innovations.																	
Skill Internship Program (Soft Skill): Minimum 45 hours duration: To be credited in II Semester.																	

^s Semester Proficiency— includes the weightage towards ability/ skill/ competency /knowledge level /expertise attained etc. in the semester courses.

MCQ: Multiple Choice Question AO: Assignment + Oral PP: Pen Paper SO: Submission + Oral OB: Open Book

[#] Micro Project-I will be presented and evaluated through an interdisciplinary project evaluation committee.

HSMC	BSC	ESC	DC	DE	SPC	OC	DLC	NEC	SP	SIP	SLP	PDC	PBL	MAC	MWS
0	0	3	3	0	0	0	2	1	1	0	0	0	1	1	1
Mode of Learning								Mode of Examination						Total Credits	
Theory		NEC		Lab			Theory			NEC	Lab				
Face to Face	Online	Interactive	Face to Face	Blended	Experiential	Experimental	PP	MCQ	OB	SO	AO	SO			
13	0	1	1	0	1	3	6	7	0	1	3	3	39		
68.42%	0%	5.26%	5.26%	0%	5.26%	15.78%	31.57%	36.84 %	0%	5.26%	15.78%	15.78%	Credits %		



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Scheme of Evaluation

B. Tech. II Semester (ET) (for batch admitted in academic session 2024-25)

S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted						Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Major Evaluation.	Duration of Major Evaluation.
				Theory Block				Practical Block			L	T	P				
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation								
				Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment		Lab Work & Sessional									
1.	20241201	DC	Communication Networks	20	20	30	30	-	-	100	3	-	-	3	Face to Face	PP	2 Hrs
2.	20241202	DC	Electronic Circuits	20	20	30	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
3.	20241203	DC	Signals and Systems	20	20	30	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
4.	20241204	DC	Digital Circuits and Systems	20	20	30	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
5.	20241205	BSC	Linear Algebra and Differential Equation	20	20	30	30	-	-	100	3	-	-	3	Face to Face	PP	2 Hrs
6.	20241206	DLC	Digital Logic Design Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
7.	20241207	DLC	Problem Solving through Python Programming	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
8.	20241208	SP	Semester Proficiency ^{\$}	-	-	-	-	50	-	50	-	-	2	1	Face to Face	SO	-
9.	20241209	PBL	Micro Project-II [#]	-	-	-	-	70	30	100	-	-	2	1	Experiential	SO	-
10.	20241210	ESC	Engineering Physics Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
11.	20241211	HSMC	Language Lab	-	-	-	-	70	30	100	-	-	2	1	Blended	AO	-
12.	NECXXXXX	NEC	Novel Engaging Course (Activity Based Learning)	-	-	-	-	50	—	50	-	1	-	1	Interactive	SO	-
13.	SIPXXXX	SIP	Skill Internship Program (Soft Skill)	-	-	-	-	60	—	60	-	-	-	2**	Experiential	SO	-
Total				100	100	150	150	510	150	1160	12	04	12	24	-	-	-
14.	20241212	MAC	Sustainability & Environmental Science	20	20	30	30	-	-	100	2	-	-	GRADE	Blended	MCQ	1.5Hrs
15.		MWS	Mandatory Workshop on Indian Knowledge System at Department Level (Duration: Two Days)											GRADE	Interactive	MCQ	-
Summer Semester of six-eight week duration will be conducted for makeup of I & II semester examination.																	

Summer Semester of six-eight week duration will be conducted for makeup of I & II semester examination.

⁵Semester Proficiency– includes the weightage towards ability/ skill/ competency /knowledge level /expertise attained etc. in the semester courses ,

MCQ: Multiple Choice Question **AO:** Assignment + Oral **PP:** Pen Paper **SO:** Submission + Oral **OB:** Open Book

[#] Micro Project-II will be presented and evaluated through an interdisciplinary project evaluation committee.

^{**} These credits will be transferred from Skill Internship Program (Soft Skill).

HSMC	BSC	ESC	DC	DE	SPC	OC	DLC	NEC	SP	SIP	SLP	PDC	PBL	MAC	MWS	
1	1	1	4	0	0	0	2	1	1	1	0	0	1	1	1	
Mode of Learning											Mode of Examination					Total Credits
Theory		NEC		Lab			Theory			NEC		Lab				
Face to Face	Online	Interactive	Face to Face	Blended	Experiential	Experimental	PP	MCQ	OB	SO	AO	SO				
15	0	1	1	1	3	3	6	9	0	1	3	3				
62.5%	0%	4.16%	4.16%	4.16%	12.5%	12.5%	25%	37.5 %	0%	4.16%	12.5%	12.5%	Credits %			



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Scheme of Evaluation

B. Tech. III Semester (ET) (for batch admitted in academic session 2024-25)

S. No.	Course Code		Category Code	Course Name	Maximum Marks Allotted						Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Major Evaluation.	Duration of Major Evaluation.
					Theory Block				Practical Block									
					Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation								
					Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment		Lab Work & Sessional									
1.	20242101		BSC	Probability and Random Processes	20	20	30	30	-	-	100	3	-	-	3	Face to Face	PP	2 Hrs
2.	20242102		DC	Data Structures	20	20	30	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
3.	20242103		DC	Analog Communication	20	20	30	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
4.	20242104		DC	Analog Integrated Circuits	20	20	30	30	-	-	100	2	1	-	3	Face to Face	PP	2 Hrs
5.	20242105		DC	Linear Control Theory	20	20	30	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
6.	20242106		DLC	Analog Communication Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
7.	20242107		DLC	Analog Integrated Circuits Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
8.	20242108		SP	Semester Proficiency ^{\$}	-	-	-	-	50	-	50	-	-	2	1	Face to Face	SO	-
9.	20242109		PBL	Macro Project-I [#]	-	-	-	-	70	30	100	-	-	2	1	Experiential	SO	-
10.	20242110		SLP	Self-learning/Presentation ^{\$\$\$} (SWAYAM/NPTEL/MOOC)	-	-	-	-	40	-	40	-	-	2	1	Mentoring	SO	-
11.	NECXXXXX		NEC	Novel Engaging Course (Activity Based Learning)	-	-	-	-	50	-	50	-	1	-	1	Interactive	SO	-
Total					100	100	150	150	350	90	940	11	05	10	21	-	-	-
12.	20242311	MAC	Cyber Security		20	20	30	30	-	-	100	2	-	-	GRADE	Blended	MCQ	1.5Hrs
13.		MWS	Mandatory Workshop on Internet of Things(IoT) at Department Level (Duration: Two Days)												GRADE	Interactive	MCQ	-
Skill Internship Program(Institute Level) (Qualifier): Minimum 30 hours duration: To be credited in IV Semester																		

Skill Internship Program(Institute Level) (Qualifier): Minimum 30 hours duration: To be credited in IV Semester

^{\$}Semester Proficiency-- includes the weightage towards ability/ skill/ competency /knowledge level /expertise attained etc. in the semester courses

MCQ: Multiple Choice Question AO: Assignment + Oral PP: Pen Paper SO: Submission + Oral OB: Open Book

[#] Macro Project-I will be presented and evaluated through an interdisciplinary project evaluation committee.

^{\$\$\$} Compulsory registration for one online course using SWAYAM/NPTEL/ MOOC, evaluation through attendance and presentation.

HSMC	BSC	ESC	DC	DE	SPC	OC	DLC	NEC	SP	SIP	SLP	PDC	PBL	MAC	MWS
0	1	0	4	0	0	0	2	1	1	0	0	0	1	1	1

Mode of Learning							Mode of Examination						Total Credits
Theory		NEC	Lab				Theory			NEC	Lab		
Face to Face	Online	Interactive	Face to Face	Blended	Experiential	Experimental	PP	MCQ	OB	SO	AO	SO	
15	0	1	1	0	1	2	6	9	0	1	2	4	42
71.42%	0%	4.76%	4.76%	4.16%	4.76%	9.5%	28.57%	42.85 %	0%	4.16%	9.52%	19.04%	Credits %



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Scheme of Evaluation

B. Tech. IV Semester (ET)(for batch admitted in academic session 2024-25)



S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted						Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Major Evaluation.	Duration of Major Evaluation.
				Theory Block				Practical Block			L	T	P				
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation								
				Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment		Lab Work & Sessional									
1.	20242201	DC	Linear Control Theory	20	20	30	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
2.	20242202	DC	Microprocessor and Interfacing	20	20	30	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
3.	20242203	DC	Digital Communication	20	20	30	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
4.	20242204	DC	Electromagnetic Fields	20	20	30	30	-	-	100	2	1	-	3	Face to Face	PP	2 Hrs
5.	20242205	DC	VLSI Design	20	20	30	30	-	-	100	3	-	-	3	Face to Face	PP	2 Hrs
6.	20242206	DLC	Microprocessor and Interfacing Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
7.	20242207	DLC	Digital Communication Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
8.	20242208	DLC	VLSI Design Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
9.	20242209	SP	Semester Proficiency ^{\$}	-	-	-	-	50	-	50	-	-	2	1	Face to Face	SO	-
10.	20242210	PBL	Macro Project-II [#]	-	-	-	-	70	30	100	-	-	2	1	Experiential	SO	-
11.	20242211	PC	Professional Certification	-	-	-	-	50	-	50	-	-	2	1	Blended	SO	-
12.	NECXXXXX	NEC	Novel Engaging Course (Activity Based Learning)	-	-	-	-	50	-	50	-	1	-	1	Interactive	SO	-
13.	SIP3XXXX	SIP	Skill Internship Program	-	-	-	-	60	-	60	-	-	-	2**	Experiential	SO	-
Total				100	100	150	150	490	188	1110	11	05	12	24	-	-	-
14.	20242212	MAC	Project Management, Economics & Financing	20	20	30	30	-	-	100	2	-	-	GRADE	Blended	MCQ	1.5 Hrs
15.	20242213	MWS	Mandatory Workshop on Computer Vision at Department Level (Duration: Two Days)											GRADE	Interactive	MCQ	-
16.		MWS	Mandatory Workshop on Life Skills at Department Level (Duration: Two Days)											GRADE	Interactive	MCQ	-
Summer Semester of six-eight week duration will be conducted for makeup of previous semester examination.																	
Additional Course for Honours or Minor Degree: Permitted to opt for maximum two additional courses for the award of Honours or Minor Degree																	

Summer Semester of six-eight week duration will be conducted for makeup of previous semester examination.

Additional Course for Honours or Minor Degree: Permitted to opt for maximum two additional courses for the award of Honours or Minor Degree

^{\$}Semester Proficiency– includes the weightage towards ability/ skill/ competency /knowledge level /expertise attained etc. in the semester courses

MCQ: Multiple Choice Question **AO:** Assignment + Oral **PP:** Pen Paper **SO:** Submission + Oral **OB:** Open Book

[#] Macro Project-II will be presented and evaluated through an interdisciplinary project evaluation committee.

^{**} These credits will be transferred from Skill Internship Program.

PC	BSC	ESC	DC	DE	SPC	OC	DLC	NEC	SP	SIP	SLP	PDC	PBL	MAC	MWS
1	0	0	5	0	0	0	3	1	1	1	0	0	1	1	2

Mode of Learning							Mode of Examination						Total Credits
Theory		NEC	Lab				Theory			NEC	Lab		
Face to Face	Online	Interactive	Face to Face	Blended	Experiential	Experimental	PP	MCQ	OB	SO	AO	SO	
15	0	1	1	0	3	3	6	9	0	1	3	5	
62.5%	0%	4.16%	4.16%	0%	4.16%	9.5%	25%	37.5 %	0%	4.16%	12.5%	20.83%	Credits %



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Scheme of Evaluation

B. Tech. V Semester (ET) (for batch admitted in academic session 2024-25)



S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted								Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Major Evaluation.	Duration of Major Evaluation.
				Theory Block				Practical Block		MOOCs									
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation	Assignment	Exam								
				Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment		Lab Work & Sessional											
1.	20243101	DC	Digital Signal Processing	20	20	30	30	-	-	-	-	100	2	1	-	3	Face to Face	PP	2 Hrs
2.	20243102	DC	Antenna and Wave Propagation	20	20	30	30	-	-	-	-	100	2	1	-	3	Face to Face	PP	2 Hrs
3.	20243103	DC	Data Science	20	20	30	30	-	-	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
4.	202431XX	DE	Departmental Elective* (DE-1)	-	-	-	-	-	-	25	75	100	3	-	-	3	Online	MCQ	3 Hrs
5.	20243104	SPC	Specialization Course (SPC-1)	20	20	30	30	-	-	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
6.	20243105	DLC	Digital Signal Processing Lab	-	-	-	-	70	30	-	-	100	-	-	2	1	Experimental	AO	-
7.	20243106	DLC	Data Science Lab	-	-	-	-	70	30	-	-	100	-	-	2	1	Experimental	AO	-
8.	20243107	SP	Semester Proficiency ^{\$}	-	-	-	-	50	-	-	-	50	-	-	2	1	Face to Face	SO	-
9.	20243108	PBL	Cornerstone Project	-	-	-	-	70	30	-	-	100	-	-	4	2	Experiential	SO	-
Total				80	80	120	120	260	90	25	75	850	11	04	10	20	-	-	-
10.	20243109	MAC	Supply Chain Management	20	20	30	30	-	-			100	2	-	-	GRADE	Blended	MCQ	1.5 Hrs
11.		MWS	Mandatory Workshop on Blockchain at Department Level (Duration: Two Days)													GRADE	Interactive	MCQ	-
Additional Course for Honours or Minor Degree: Permitted to opt for maximum two additional courses for the award of Honors or Minor Degree																			

Additional Course for Honours or Minor Degree: Permitted to opt for maximum two additional courses for the award of Honors or Minor Degree

^{\$}Semester Proficiency– includes the Weightage towards ability/ skill/ competency /knowledge level /expertise attained etc. in the semester courses

MCQ: Multiple Choice Question **AO:** Assignment + Oral **PP:** Pen Paper **SO:** Submission + Oral **OB:** Open Book

* Course run through SWAYAM/NPTEL/ MOOC Learning Based Platform

SMC	BSC	ESC	DC	DE	SPC	OC	DLC	NEC	SP	SIP	SLP	PDC	PBL	MAC	MWS
0	0	0	3	1	1	0	2	0	1	0	0	0	1	1	1

Mode of Learning							Mode of Examination						Total Credits
Theory		NEC	Lab				Theory			NEC	Lab		
Face to Face	Online	Interactive	Face to Face	Blended	Experiential	Experimental	PP	MCQ	OB	SO	AO	SO	
12	3	0	1	0	2	2	6	9	0	0	2	3	
60%	15%	0%	5%	0%	10%	10%	30%	45 %	0%	4.16%	10%	15%	Credits %



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Scheme of Evaluation

B. Tech. VI Semester (ET)(for batch admitted in academic session 2024-25)



S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted								Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Major Evaluation.	Duration of Major Evaluation.
				Theory Block				Practical Block		MOOCs			L	T	P				
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation	Assignment	Exam								
				Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment		Lab Work & Sessional											
1.	20243201	DC	Mobile Communication and 5G Networks	20	20	30	30	-	-	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
2.	20243202	DC	Artificial Intelligence & Machine Learning	20	20	30	30	-	-	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
3.	202432XX	DE	Departmental Elective* (DE-2)	-	-	-	-	-	-	25	75	100	3	-	-	3	Online	MCQ	3 Hrs
4.	202432XX	OC	Open Category Course (OC-1)	20	20	30	30	-	-	-	-	100	2	1	-	3	Face to Face	PP	2 Hrs
5.	20243203	SPC	Specialization Course (SPC-2)	20	20	30	30	-	-	-	-	100	3	-	-	3	Face to Face	PP	2 Hrs
6.	20243204	DLC	Embedded System Lab	-	-	-	-	70	30	-	-	100	-	-	2	1	Experimental	AO	-
7.	20243205	DLC	Artificial Intelligence & Machine Learning Lab	-	-	-	-	70	30	-	-	100	-	-	2	1	Experimental	AO	-
8.	20243206	SP	Semester Proficiency ^{\$}	-	-	-	-	50	-	-	-	50	-	-	2	1	Face to Face	SO	-
9.	20243207	PBL	Capstone Project	-	-	-	-	70	30	-	-	100	-	-	4	2	Experiential	SO	-
Total				80	80	120	120	260	90	25	75	850	12	03	10	20	-	-	-
10.	20243208	MAC	Disaster Management	20	20	30	30	-	-	-	-	100	2	-	-	GRADE	Blended	MCQ	1.5 Hrs
11.		MWS	Mandatory Workshop on Intellectual Property Rights at Department Level (Duration: Two Days)													GRADE	Interactive	MCQ	-

Skill Enhancement Program/Research Internship/On Job Training for Four weeks duration (Optional)

Summer Semester of six-eight week duration will be conducted for makeup of V & VI semester examination.

Additional Course for Honours or Minor Degree: Permitted to opt for maximum two additional courses for the award of Honours or Minor Degree

^{\$}Semester Proficiency– includes the weightage towards ability/ skill/ competency /knowledge level /expertise attained etc. in the semester courses

MCQ: Multiple Choice Question AO: Assignment + Oral PP: Pen Paper SO: Submission + Oral OB: Open Book

* Course run through SWAYAM/NPTEL/ MOOC Learning Based Platform.

HSMC	BSC	ESC	DC	DE	SPC	OC	DLC	NEC	SP	SIP	SLP	PDC	PBL	MAC	MWS
0	0	0	2	1	1	1	2	0	1	0	0	0	1	1	1

Mode of Learning							Mode of Examination						Total Credits
Theory		NEC	Lab				Theory			NEC	Lab		
Face to Face	Online	Interactive	Face to Face	Blended	Experiential	Experimental	PP	MCQ	OB	SO	AO	SO	
12	3	0	1	0	2	2	6	9	0	0	2	3	
60%	15%	0%	5%	0%	10%	10%	30%	45 %	0%	4.16%	10%	15%	Credits %



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Scheme of Evaluation

B. Tech. VII Semester (ET) *(for batch admitted in academic session 2024-25)*



S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted								Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Major Evaluation.	Duration of Major Evaluation.
				Theory Block				Practical Block		MOOCs									
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation	Assignment	Exam								
				Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment		Lab Work & Sessional											
1.	202441XX	DE	Departmental Elective (DE-3)	20	20	30	30	-	-	-	-	100	3	-	-	3	Face to Face	PP	2 Hrs
2.	202441XX	DE	Departmental Elective* (DE-4)	-	-	-	-	-	-	25	75	100	3	-	-	3	Online	MCQ	3 Hrs
3.	202441XX	OC	Open Category Course (OC-2)	20	20	30	30	-	-	25	75	100	2	1	-	3	Face to Face	PP	2 Hrs
4.	20244101	SPC	Specialization Course [#] (SPC-3)	20	20	30	30	-	-	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
5.	20244102	SEP	Skill Enhancement Program/Research Internship/ On Job Training	-	-	-	-		50	-	-	50	-	-	2	1**	Face to Face	SO	-
6.	20244103	DLC	Creative Problem Solving	-	-	-	-		50	-	-	50	-	-	2	1	Experiential	AO	-
Total				60	60	90	90	120	100	50	150	500	10	02	04	14	-	-	-
Additional Course for Honours or Minor Degree: Permitted to opt for maximum two additional courses for the award of Honours or Minor Degree																			

Additional Course for Honours or Minor Degree: Permitted to opt for maximum two additional courses for the award of Honours or Minor Degree

MCQ: Multiple Choice Question **AO:** Assignment + Oral **PP:** Pen Paper **SO:** Submission + Oral **OB:** Open Book

* Course run through SWAYAM/NPTEL/ MOOC Learning Based Platform.

** These credits will be transferred from Skill Enhancement Program/Research Internship/On Job Training

#Course run through MITS-DU MOOCs

HSMC	BSC	ESC	DC	DE	SPC	OC	DLC	NEC	SP	SIP	SLP	PDC	PBL	MAC	MWS
0	0	0	0	2	1	1	1	0	1	0	0	0	0	0	1

Mode of Learning							Mode of Examination						Total Credits
Theory		NEC	Lab				Theory			NEC	Lab		
Face to Face	Online	Interactive	Face to Face	Blended	Experiential	Experimental	PP	MCQ	OB	SO	AO	SO	
12	3	0	1	0	1	0	6	6	0	0	1	1	
85.17%	21.42%	0%	7.14%	0%	7.14%	0%	42.85%	42.85 %	0%	0%	7.14%	7.14%	Credits %



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Scheme of Evaluation

B. Tech. VIII Semester (ET) (for batch admitted in academic session 2024-25)

S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted								Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Major Evaluation.	Duration of Major Evaluation.
				Theory Block				Practical Block		MOOCs			L	T	P				
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation	Assignment	Exam								
				Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment													
1.	202442XX	DE	Departmental Elective* (DE-5)	-	-	-	-	-	-	25	75	100	3	-	-	3	Online	MCQ	3 Hrs
2.	202442XX	OC	Open Category Course* (OC-3)	-	-	-	-	-	-	25	75	100	3	-	-	3	Online	MCQ	3 Hrs
3.	202442XX	PBL	Industry Internship/Research Internship/ Innovation & Start-up	-	-	-	-	280	120	-	-	400	-	-	20	10	Experiential	SO	-
4.	20244202	PDC	Professional Development ^{##}	-	-	-	-	-	50	-	-	50	-	-	4	2	Interactive	SO	-
Total				-	-	-	-	280	170	50	150	650	06	-	24	18	-	-	-
Summer Semester of six-eight week duration will be conducted to complete any backlog courses.																			
Additional Course for Honours or Minor Degree: Permitted to opt for maximum two additional courses for the award of Honours or Minor Degree																			

MCQ: Multiple Choice Question **AO:** Assignment + Oral **PP:** Pen Paper **SO:** Submission + Oral **OB:** Open Book

*Course run through SWAYAM/NPTEL/ MOOC Learning Based Platform

^{##} Evaluation will be based on participation/laurels brought by the students to the institution in national/state level technical and other events during the complete tenure of the UG programme (participation in professional chapter activities, club activities, cultural events, sports, personality development activities, collaborative events, MOOCs, technical events, institute/department committees, etc.)

HSMC	BSC	ESC	DC	DE	SPC	OC	DLC	NEC	SP	SIP	SLP	PDC	PBL	MAC	MWS
0	0	0	0	1	0	1	0	0	0	0	0	1	1	0	0

Mode of Learning								Mode of Examination						Total Credits
Theory		NEC	Lab					Theory			NEC	Lab		
Face to Face	Online	Interactive	Face to Face	Blended	Experiential	Experimental	Interactive	PP	MCQ	OB	SO	AO	SO	
0	6	0	0	0	10	0	2	0	6	0	0	0	12	
0%	33.33%	0%	0%	0%	55.55%	0%	11.11%	0%	33.33 %	0%	0%	0%	7.14%	Credits %



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Annexure II

Item 2	To review & finalize the syllabi for all courses of B. Tech I Semester (for batch admitted in 2024-25) under the flexible curriculum along with their COs.
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Department of Electronics Engineering
Syllabus (EL/ET)

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
20241101	DC	Instrumentation & Sensors	20	20	30	30	-	-	100	3	-	-	3

Instrumentation & Sensors (20241101)

Course Objective:

- To understand the significance of measurement techniques, errors in measurement, and statistical analysis process, sensors, classification, operating principles, and their practical use to design smart electronic systems.

Unit 1: Measurement Systems: Introduction, Significance of measurement, block diagram of measurement system, methods of measurements, elements and their functions of measurement systems, applications, characteristics of measurement systems-static and dynamic, Static characteristics- accuracy, precision, sensitivity, reproducibility, drift, static error, dead zone, linearity, resolution, hysteresis, loading effects, Dynamic characteristics- Speed of response, measuring lag, fidelity, dynamic error, calibration.

Unit 2: Errors in Measurement and their Statistical Analysis: Types of Error- Gross, Systematic (Instrumental, Environmental, Observational error), and random error, Statistical treatment of data-measurement tests, histogram, arithmetic mean, dispersion measurement, range, deviation, average deviation, standard deviation, variance, Noise, signal to noise ratio.

Unit 3: Thermal Sensors: Introduction, Sensor Classifications, Sensors Parameters, Selection criterion of Sensors, General requirements for interfacing, Temperature sensors, Thermo resistive sensors- Resistance Temperature Detectors, Thermistor, Thermoelectric sensors- Thermocouple, Electric Sensors- Capacitive position, proximity, and displacement sensors, LVDT.

Unit 4: Force and Pressure Sensors: Introduction, Force sensor- Strain gauge, Semiconductor strain gauge, Strain gauge accelerometers, Pressure sensors- Mechanical pressure sensors, Piezoresistive pressure sensor, Capacitive pressure sensor.

Unit 5: Humidity and Moisture Sensors: Humidity and moisture sensors- Resistive humidity sensor, capacitive moisture sensors, Thermal conduction moisture sensors, Light dependent resistor (LDR).



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Text Book:

1. A.K. Sawhney: "A Course in Electrical and Electronic Measurements and Instrumentation", 18th Edition, Dhanpat Rai Publications, 2001.
2. Nathan Ida, "Sensors, Actuators and Their Interfaces, A multidisciplinary introduction", 2nd Edition, IET Publication.

Reference Books:

1. Subhash Chanda Mukhopadhyay, "Intelligent Sensing, Instrumentation and Measurements," Springer Publication.
2. Sanjay N. Talbar, Akhilesh R. Upadhyay, Instrumentation and Measurement, Dhanpat Rai Publishing Company. Third Edition 2004.
3. Process Control Instrumentation Technology, Curtis D. Johnson, PHI
4. A Hands-On Course in Sensors Using the Arduino and Raspberry Pi, Volker Zeimann, CRC Press.

Course Outcomes (COs):

After completion of this course students will be able to:

CO1. Examine the measurement systems, significance, and their characteristics.

CO2. Evaluate the errors in measurement systems.

CO3: Analyse the selection criteria and parameters for various sensors.

CO4: Describe the working of force, pressure, humidity and moisture sensors.

CO5: Differentiate sensors based on their applications.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	1	2	2	2	2	2	1	1	1	3	3	3
CO2	3	3	1	3	2	2	2	2	1	1	1	3	3	3
CO3	3	3	1	1	3	2	2	2	1	1	1	3	3	3
CO4	3	2	1	1	3	2	2	2	1	1	1	3	3	3
CO5	3	2	1	1	3	2	2	2	1	1	1	3	3	3

1 - Slightly; 2 - Moderately; 3 – Substantially



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Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
20241103	DC	Electronics Devices	20	20	30	30	-	-	100	2	1	-	3

Electronics Devices (20241103)

Course Objective: To understand of the fundamental principles and operational characteristics of electronic devices, and apply this knowledge in practical electronic applications and further advanced studies in electronics.

Unit I: Semiconductor Physics: Elemental & Compound Semiconductor Materials, Bonding Forces and Energy Bands in Intrinsic and Extrinsic Silicon, Charge Carrier in Semiconductors, Carrier Concentration, Extrinsic Semiconductor, Hall Effect, Mechanism of Current Flow, Drift Current, Diffusion Current, Einstein Relation, Continuity Equation.

Unit II: Semiconductors Diodes: P-N Junction properties, Diode Characteristics, Equilibrium condition, biased junction, Steady state condition, P-N Junction breakdown mechanism, Capacitance of junction barrier, Diode circuit parameters, Basic circuits of Rectifier, Clippers and Clampers.

Unit III: Types of Diodes: Basic operation and characteristics of; Zener diode, Zener diode as a voltage regulator, Tunnel diode, Varactor diode, Schottky diode, Light emitting diode, Photo-diode.

Unit IV: Transistors (BJT & FET): Bipolar Junction Transistors; Construction, basic operation, current components and equations, CB, CE and CC configuration, input and output characteristics, Early effect, Region of operations: active, cut-off and saturation region.
Field effect transistors; Construction and characteristics of JFET, working principle of JFET. MOSFET construction and characteristics, MOSFET enhancement and depletion mode.

Unit V: Power Electronics Devices: Basic principle and working of SCR, IGBT, Uni-junction Transistor (UJT) and Thyristors. UJT: Principle of operation, characteristics.

Text Books:

1. Electronics Devices and Circuits: Boylested & Nashelsky, 11th Edition, Pearson Education India
2. Electronic devices and circuits: S. Salivahanan, 2nd Edition, Tata McGraw-Hill Education, 2011.



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3. Microelectronic Circuits: Theory and Application: Sedra & Smith, 7th Edition, Oxford University Press.

Reference Books:

1. Micro Electronics: Millman, & Grabel, 2nd Edition, McGraw Hill Education
2. Integrated Electronics: Millman & Halkias, McGraw Hill Education.

Course Outcomes

After the completion of this course students will be able to:

- CO1. Explain** the semiconductor materials with their importance.
- CO2. Design** the circuits using diodes.
- CO3. Analyze** the construction, operation, and characteristics of various diodes.
- CO4. Compare** the characteristics of Bipolar Junction Transistors (BJT) and Field Effect Transistors (FET).
- CO5. Explain** the working and characteristics of power electronics devices.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1	2	1	1	2	2	1	2	—	3	2	2
CO2	3	3	3	3	2	2	2	2	2	2	2	3	3	3
CO3	3	3	2	3	3	3	2	1	2	2	3	3	3	3
CO4	3	3	3	3	3	3	2	1	2	2	3	3	3	3
CO5	3	3	2	1	2	3	2	1	2	2	1	3	2	2

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Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/ Assign ment Marks	Major Evaluation	Continuous Evaluation/ Lab work & Sessional	Major Evaluation		L	T	P	
20241104	DC	Network Theory	20	20	30	30	-	-	100	2	1	-	3

Network Theory (20241104)

Course objective: To understand basic electric circuits, study of network theorems, transient analysis, analysis of two port networks.

Unit-I Introduction – Basics of Circuit Elements, Characteristics of Independent & Dependent Sources, KCL & KVL for circuits with dependent & independent sources, Dot convention for coupled inductor and their characteristics, co-efficient of coupling.

Unit-II Network theorems: Superposition theorem, Thevenin theorem, Norton theorem, Millman theorem, Reciprocity theorem and Maximum Power Transfer theorem for various types of dependent and independent power source networks.

Unit-III Laplace Transform & Passive Filters: The Laplace transform, Properties of Laplace transform, Initial and final value theorem. Waveform synthesis & Laplace Transform of various waveform function, Low pass, high pass, band pass and band elimination filters,

Unit-IV Transient analysis: Transients in RL, RC and RLC circuits, initial conditions, time constants, Steady state analysis, Node and mesh analysis of RL, RC and RLC networks with sinusoidal sources.

Unit-V Two Port Network: Concept of Ports, Calculation of network functions for one port and two port, Two port parameters – Z, Y, hybrid and chain Parameters, Relationship between two port network parameters, T and π networks, Characteristics impedance & propagation constant.

Text Books:

1. Network Analysis: M.E. Van Valkenberg, 3rd Edition, Prentice Hall of India.
2. Network and Systems: D. Roy Chaudhary, 2nd Edition, New Academic Science Ltd.

Reference Books:

1. Introduction to Modern Network Synthesis: M.E. Van Valkenberg, Prentice Hall of India.
2. Network Analysis & Synthesis: F. Kuo, 2nd Edition, Wiley & Sons.
3. Network Analysis & Synthesis: Ravish R Singh, 1st Edition, McGraw Hill Education.



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Course Outcomes

After the completion of this course students will be able to:

- CO1. **Analyze** the circuits using Kirchoff's laws.
CO2. **Apply** Network theorems for the simplification of circuits.
CO3. **Apply** the Laplace transform to linear circuits and systems.
CO4. **Evaluate** transient response and steady state response.
CO5. **Determine** ABCD, Z, Y and h parameters of an electrical circuit.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	2	1	1	2	1	2	1	2	2	3	3	3
CO2	3	3	3	3	2	3	1	2	2	1	3	3	2	2
CO3	3	3	3	3	2	2	1	-	1	2	1	2	3	3
CO4	3	3	2	2	2	2	2	-	2	1	1	2	3	3
CO5	3	3	3	2	3	3	1	1	1	1	2	3	2	3

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Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation	Minor Evaluation	Quiz/Assign ment Marks	Major Evaluation	Continuous Evaluation/ Lab work & Sessional	Major Evaluation		L	T	P	
			I	II									
20241102	ESC	Computer Programming	20	20	30	30	-	-	100	2	-	-	2

Computer Programming (20241102)

Course Objectives: Equip students with the skills to design and implement programming solutions in C++ using fundamental algorithms, approaches, and documentation techniques.

Unit I: Introduction to Programming: Types of computer programming languages, Program Execution and Translation Process, Problem solving using Algorithms and Flowcharts. Introduction to C++ Programming: Data Types, Constants, Keywords, variables, input/output, Operators & Expressions, Precedence of operators.

Unit II: Control Statements and Decision Making: Conditional statements: if, if-else, nested if, Switch statement with break and default, Loops: while, do-while, for, nested for, Loop control: break, continue, return, Decision making using logical operators, Real-world examples and applications of control structures.

Unit III: C++ Functions: Function Declaration and Definition, Function syntax, Parameter types and names, Return types and values, Function Types, Function Scope and Lifetime, Function Templates, Recursion, Recursive function definition.

Unit III: Strings and Arrays: C-style strings (character arrays), C++ string class, Declaring and initializing strings, String operations: concatenation, comparison, String manipulation functions: strlen(), strcpy(), strcat(). One-dimensional and multi-dimensional arrays, Array declaration and indexing, Array-based operations: sorting, searching.

Unit IV: C++ Pointers: Basics of Pointers & Addresses, reference variable, Pointer to Pointer, Pointer to Array, Array of Pointers, Pointer to Strings. Dynamic memory allocation using new and delete operators.

Unit V: Object Oriented Programming: Features of OOPS, Comparison of Procedural Oriented Programming with Object Oriented Programming, Abstract Data Types, Specification of Class, Visibility Modes, Defining Member Functions, Scope Resolution Operator, Creating of Objects, Static Data Member, Static Member Function, Array of Objects, Object as Arguments, Inline Function, Friend Function.



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Text Books:

- 1.C++ How to Program, H M Deitel and P J Deitel, Prentice Hall.
- 2.Programming with C++, D Ravichandran, T.M.H.
- 3.Computing Concepts with C++ Essentials, Horstmann, John Wiley.

Reference Books:

1. The Complete Reference in C++, Herbert Schildt, TMH.
2. Object-Oriented Programming in C++, E Balagurusamy.
3. Fundamentals of Programming C++, Richard L. Halterman.

COURSE OUTCOMES:

After the completion of the course, the student will be able to:

CO1: Design algorithms and flowchart for a given problem.

CO2: Implement the concepts of procedural programming with control statement.

CO3: Develop optimized recursive functions and function templates to solve challenging computational tasks.

CO4: Implement the pointer concept for effective C++ programming.

CO5: Design object-oriented programs that effectively model real-world scenarios with encapsulation and abstraction.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	1	1	1	3	1	1	1	1	1	3	2	2
CO2	3	2	2	2	1	2	1	2	2	1	1	3	2	2
CO3	3	2	2	2	2	2	1	2	2	1	1	3	2	2
CO4	3	2	1	1	2	3	1	2	2	1	1	3	2	2
CO5	3	2	1	1	1	2	1	1	1	1	1	3	2	2

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Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation	Minor Evaluation	Quiz/Assign ment Marks	Major Evaluation	Continuous Evaluation/ Lab work & Sessional	Major Evaluation		L	T	P	
			I	II									
20241105	ESC	Basic Electrical and Electronics Engineering	20	20	30	30	-	-	100	3	-	-	3

Basic Electrical & Electronics Engineering (2024105)

Course Objectives: Equip students with foundational knowledge of DC/AC circuits, magnetic circuits, transformers, electrical machines, and electronic circuits in electrical engineering.

Unit I :D.C. Circuits Analysis: Voltage and Current Sources: Dependent and independent source, Source conversion, Kirchhoff's Law, Mesh and Nodal analysis. Network theorems: Superposition theorem, Thevenin's theorem & Norton's theorem and their applications.

Unit II :Single-phase AC Circuits: Generation of sinusoidal AC voltage, definitions: Average value, R.M.S. value, Form factor and Peak factor of AC quantity, Concept of Phasor, analysis of R-L, R-C, R-L-C Series and Parallel circuit, Power and importance of Power factor.

Unit III- Magnetic Circuits: Basic definitions, AC excitation in magnetic circuits, self-inductance and mutual inductance, Induced voltage, laws of electromagnetic Induction, direction of induced E.M.F. Flux, MMF and their relation, analysis of magnetic circuits.

Unit IV:Single-phase Transformer &Rotating Electrical Machines: Single phase transformer, Basic concepts, construction and working principal, Ideal Transformer and its phasor diagram at No Load, Voltage, current and impedance transformation, Equivalent circuits and its Phasor diagram, voltage regulation, losses and efficiency, testing of transformers, Construction & working principle of DC and AC machine.

Unit V - Digital Electronics, Devices & Circuits: Number systems used in digital electronics, decimal, binary, octal, hexadecimal, their complements, operation and conversion, Demorgan's theorem, Logic gates- symbolic representation and their truth table, Introduction to semiconductors, Diodes, V-I characteristic, Bipolar junction transistors and their working, Introduction to CB, CE & CC transistor configurations.

Text Books:

1. Basic Electrical and Electronics Engineering, D.P. Kothari & I.J. Nagrath-Tata McGraw Hill
2. Basic Electrical and Electronics Engineering, S. K Bhattacharya -Pearson
3. Electrical Machinery- A.E. Fitzgerald, C. Kingsley and Umans - TMH
4. Principles of Electrical Engineering- Vincent Del Toro- Prentice Hall.
5. Basic Electrical Engineering -A,E. Fitzgerald, Higginbotham and Grabel -TMH
6. Integrated Electronics- Millmann & Halkias



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Reference Books

1. Principles of Electrical Engineering- Vincent Del Toro- Prentice Hall.
2. Basic Electrical Engineering -A,E. Fitzgerald, Higginbotham and Gabel -TMH
3. Integrated Electronics- Millmann & Halkias

Course Outcomes

After the completion of the course, the student will be able to –

- CO 1. Solve** dc & ac circuits by applying fundamental laws & theorems
- CO 2. Compare** the behavior of electrical and magnetic circuits for given input
- CO 3. Explain** the working principle, construction, applications of rotating electrical machines
- CO 4. Explain** the working principle, constructional details, losses & applications of single phase transformer.
- CO 5. Select** the logic gates for various applications in digital electronic circuits.
- CO 6. Explain** characteristics of Diode and Transistor.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	1	1	-	3	-	-	-	1	-	3	2	2
CO2	3	2	2	2	1	2	1	2	2	1	1	3	2	2
CO3	3	2	2	2	2	2	1	2	2	1	1	3	2	2
CO4	3	2	1	1	2	3	1	2	2	1	-	3	2	2
CO5	3	2	1	1	-	2	1	1	1	1	-	3	2	2

1 - Slightly; 2 - Moderately; 3 – Substantially



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Annexure III

Item 3	To review and finalize the Experiment list/ Lab manual for all the Laboratory Courses and Micro Project-I to be offered in B.Tech. I semester along with their COs.
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Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/ Assign ment Marks	Major Evaluation	Continuous Evaluation/ Lab work & Sessional	Major Evaluation		L	T	P	
20241109	DLC	Micro Project-I [#]					70	30	100	-	-	2	1

Micro Project-I[#] (20241109)

Course Objectives: To Fabricate Electronic Circuits on PCB.

List of Microprojects

1. Design a half and full wave rectifier circuits.
2. Design hardware model for Simple Rain Water Alarm System.
3. Design hardware model for Flashing Lamps Using 555 Timer.
4. Design hardware model for DC Power Supply.
5. Design hardware model for Simple Light Sensitivity Metronome Using Transistors.
6. Design hardware model for Simple Temperature Monitor.
7. Design hardware model for Invisible Burglar Alarm.
8. Design hardware model for Automatic Door Bell Ringer.
9. Design hardware model for Electronic Fuse.
10. Design hardware model for Geyser timer circuit
11. Design hardware model for Water Sensor Alarm.
12. Design a circuit for BJT as a Touch Switch.
13. Design a circuit for Water Level Indicator.
14. Design a circuit for LED Blinker Circuit.
15. Design a circuit for Automatic Night Light.
16. Design a circuit for Fire Alarm Detector.
17. Design a circuit for Automatic Smoke Detector.
18. Design a circuit for Laser-based Security System.
19. Design a circuit for Auto Water Pump Switcher.
20. Design a circuit for wireless Power Transfer System.
21. Design a Clap Circuit for Controlling Home Automation (light & fan).



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Course Outcomes

- CO1: **Analyze** the electronic components, measuring instruments, and tools.
- CO2: **Design** and simulate the schematic, layout using CAD software.
- CO3: **Design** and fabricate PCBs for various electronic circuits individually and in a team.
- CO4: **Troubleshoot** the fabricated circuit individually and in a team.
- CO5: **Implementation** of electronic mini project that benefits society.



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Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/ Assign ment Marks	Major Evaluation	Continuous Evaluation/ Lab work & Sessional	Major Evaluation		L	T	P	
20241107	DLC	Electrical and Electronics Lab					70	30	100	-	-	2	1

Electrical and Electronics Lab (20241107)

Course Objective: Develop skills in designing and testing electrical and electronic circuits.

List of Experiment

1. To determine the volt –ampere characteristics of diode in forward bias & reverse bias condition.
2. Verification of Kirchhoff's Current Law & Kirchhoff's Voltage Law.
3. Verification of Superposition Theorem.
4. To determine resistance & inductance of a choke coil.
5. To determine active & reactive power in a single phase A.C circuit.
6. To determine voltage ratio & current ratio of a single phase transformer.
7. To determine the polarity of a single phase transformer.
8. To perform open circuit & short circuit test on a single phase transformer.
9. Measurement of various Electrical Quantities using multimeter.
10. Study of construction details of D.C machine.

Course Outcomes:

After the completion of the lab, the student will be able to -

1. Verify circuit theorems.
2. Perform tests on transformer for determination of losses, efficiency & polarity.
3. Demonstrate the constructional features of electrical machines
4. Acquire teamwork skills for working effectively in groups
5. Prepare an organized technical report on experiments conducted in the laboratory.



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Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
20241106	DLC	Computer Programming Lab					70	30	100	-	-	2	1

Computer Programming Lab (20241106)

Course Objectives: Develop skills in modular programming by writing reusable functions and dividing the code into logical modules.

List of Experiments

1. WAP to perform addition, subtraction, multiplication and division of integer and floating values.
2. WAP to perform swapping between two user entered values without using third variable.
3. WAP to take temperature from the user in Fahrenheit, then convert and display the temperature in Celsius and Kelvin.
4. WAP to calculate and display Simple Interest where the principle, rate and time are given by the user.
5. WAP to calculate and print the values of $\sin\theta$, $\cos\theta$ and $\tan\theta$ using math.h library.
6. WAP to implement Pythagoras Theorem.
7. WAP to display whether a user entered number is even or odd.
7. WAP to check and display whether a user entered number is divisible by 30 or not (using nested if).
8. WAP to find and display the greatest number among the three numbers entered by the user.
9. WAP to check and print whether a user entered number is negative, positive or zero.
10. WAP to print whether a user entered character is vowel or consonant using switch-case.
11. WAP to print mathematical table of a user entered number (example, $5*1=5$) (for loop).
12. WAP to find factorial of a user entered number using while loop.
13. WAP to print all the numbers between 1 to 100 whose sum of the is even (do-while loop).
14. WAP to find factorial of a user entered number using recursion.
15. WAP to print the maximum and minimum element of a user entered 1D array and sort the array elements in ascending and descending order.
16. WAP to search an element and print its position in a user entered 2D array.
17. WAP to take enrollment number, name, 5 subject marks form students and calculate and print percentage along with their respective enrollment numbers using structure.



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Course Outcomes

After completing the lab, students will be able to:

CO1 Demonstrate the computer programming concepts data types, sizes, variable name, declaration and statements using C++.

CO2 Implement the programming of string and arrays using C++.

CO3 Implement the use of functions in C++.